MARVELS OF SCIENCE

NO. 2.
F.D.C.
10¢

A COMIC FOR YOUNGSTERS AND ADULTS

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STAGES OF SOLAR ECLIPSE

SUCCESSIVE VIEWS MADE THROUGH GAPS IN CLOUDS WHICH OFTEN SCREENED THE SUN AND MOON.

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MARVELS of SCIENCE

A Letter From the Publisher

Friends, here's our second issue. We've tried hard to make it even more appealing than its predecessor. The subjects depicted for your reading pleasure present, we believe, sufficient variety to constitute general appeal. We want you kids to read MARVELS of SCIENCE and then discuss what you've learned with your parents and teachers. And we hope that you parents and teachers will use MARVELS OF SCIENCE as a medium for entertainingly presenting some of these fundamentals of science to your children and your pupils. Let's look over some of this issue's subject matter together—for instance, the story of helicopters and a young man who helped develop them—invasion of the sport world by science — railroads, their past and future—wonders in the field of glass manufacture — breathing experiments at Harvard University—how the Atomic Age may influence our daily lives — manufacture of synthetic quinine—what goes on in the plant world — how to be weather wise—new inventions—and finally, a short story about Dr. Ernest Chain, one of the heroes of science.

We are grateful for the many letters of comment, suggestion and criticism with which you greeted the first issue of MARVELS of SCIENCE. Won't you continue to write us? When you've read this magazine, please tell us whether or not you liked it, and why. Thank you

Ted Charlton,
Publisher

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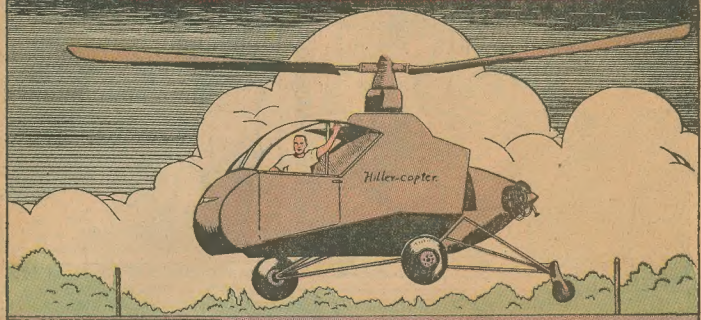
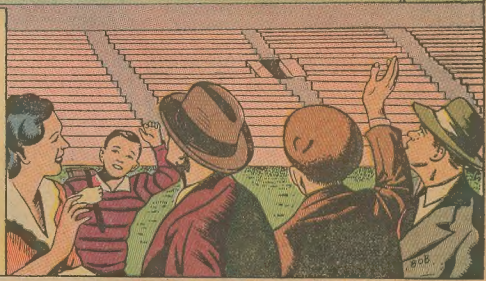
HELICOPTER BOY WIZARD



FUTURE HISTORIANS MIGHT EASILY DUB 20-YEAR OLD STANLEY HILLER THE BOY WIZARD OF AVIATION. FOR WHEN HE WAS 19, STANLEY INVENTED AND FLEW HIS "HILLER-COPTER" WHICH MAY PROVE TO BE THE MOST PRACTICAL HELICOPTER IN THE WORLD!

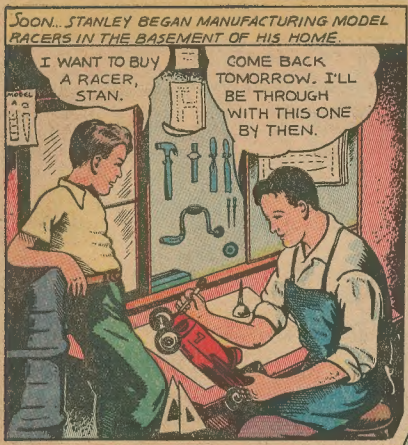


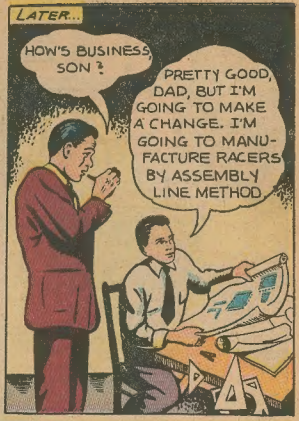
WHEN STANLEY WAS TWELVE YEARS OLD

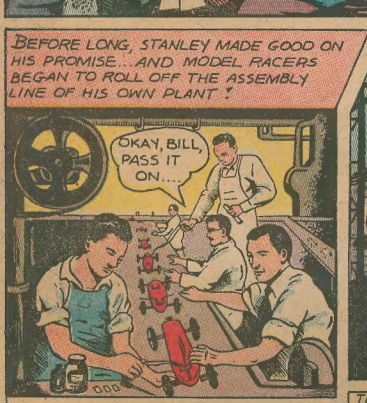
HOW DO YOU LIKE MY NEW RACER, MOTHER AND DAD?

IT'S A BEAUT, SON... THE BEST YOU'VE EVER MADE.

I'M GLAD YOU THINK SO BECAUSE I'M GOING INTO THE BUSINESS FOR MYSELF!

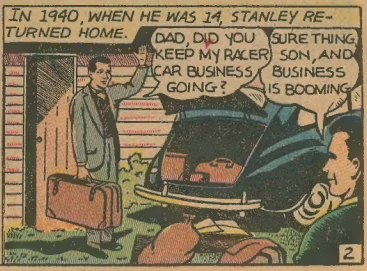

SOON... STANLEY BEGAN MANUFACTURING MODEL RACERS IN THE BASEMENT OF HIS HOME.
I WANT TO BUY A RACER, STAN.
COME BACK TOMORROW. I'LL BE THROUGH WITH THIS ONE BY THEN.


LATER...
HOW'S BUSINESS SON?
PRETTY GOOD, DAD, BUT I'M GOING TO MAKE A CHANGE. I'M GOING TO MANUFACTURE RACERS BY ASSEMBLY LINE METHOD.

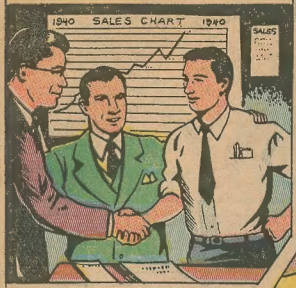

BEFORE LONG, STANLEY MADE GOOD ON HIS PROMISE...AND MODEL RACERS BEGAN TO ROLL OFF THE ASSEMBLY LINE OF HIS OWN PLANT!
OKAY, BILL, PASS IT ON...

THEN STANLEY LEFT HIS BERKELEY, CALIF. HOME TO ATTEND A COLLEGE PREPARATORY SCHOOL AT MILFORD, CONN.
SO LONG, MOTHER AND DAD!
TRACK 2
GOODBYE, TAKE CARE OF YOURSELF!

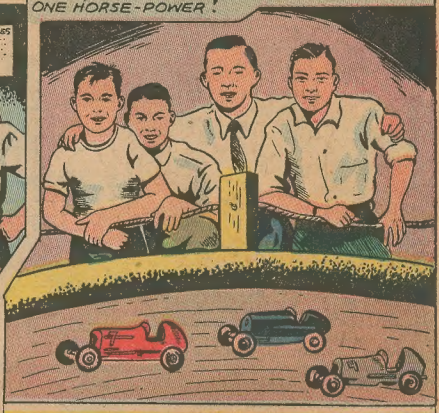
DURING HIS SPARE TIME, STANLEY READ EVERY AVIATION MAGAZINE HE COULD.
I WONDER IF I COULD INVENT A HELICOPTER THAT COULD REALLY FLY.


IN 1940, WHEN HE WAS 14, STANLEY RETURNED HOME.
DAD, DID YOU KEEP MY RACER CAR BUSINESS GOING?
SURE THING SON, AND BUSINESS IS BOOMING

WITHIN A FEW WEEKS, STANLEY TURNED OUT 250 RACERS PER MONTH, AND DID A $100,000 A YEAR BUSINESS!



WITH THE EXCEPTION OF SPARK PLUGS AND MAGNETOS, STANLEY DESIGNED AND MANUFACTURED COMPLETE ENGINES FOR THE AUTOS, WHICH GENERATED AS MUCH AS ONE HORSE-POWER!

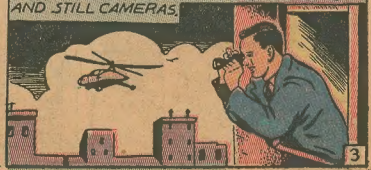


BUT OVER WEEK-ENDS AND AT NIGHT, HE SKETCHED DESIGNS OF HELICOPTERS.

THEN.... STANLEY DECIDED TO STUDY ENGINEERING AT THE UNIVERSITY OF CALIFORNIA, BUT AT THE END OF THE FIRST TERM....

IN HIS NINTH FLOOR OFFICE BUILDING LABORATORY, STANLEY TESTED WING SHAPES AS WELL AS A MECHANISM THAT CONTROLLED ROTOR BLADES IN FLIGHT.

TRYING OUT HIS MODELS OUTSIDE HIS OFFICE WINDOW, HE PHOTOGRAPHED THE TINY HELICOPTERS WITH BOTH MOVIE AND STILL CAMERAS.



A YEAR LATER, WHEN HE WAS 17, STANLEY BUILT A HELICOPTER TO HALF-SCALE, AND TOOK IT TO THE ARMY AIR FORCES MATERIAL COMMAND LAB AT WRIGHT FIELD.

SORRY, HILLER, BUT WE CAN'T HELP YOU. WE DON'T THINK YOUR HELICOPTER WILL FLY!

UNDAUNTED BY THIS REBUKE, STANLEY BOARDED A PLANE FOR WASHINGTON TO INTERVIEW A.W. LEWIS OF THE W.P.B.

IN MAY OF 1943, STANLEY WAS READY FOR THE MAIDEN FLIGHT OF HIS HILLER-COPTER .... AND FROM THE CONCRETE DRIVEWAY OF HIS HOUSE .....

Hiller-copter

THEN HE SAW GROVER LOENING, AIRCRAFT CONSULTANT OF THE W.P.B. AND CHAIRMAN OF THE NAT'L. ADVISORY COMMITTEE FOR AERONAUTICS .....

YOU CAN HAVE PRIORITIES FOR YOUR ENGINE, HILLER. IT LOOKS PROMISING TO ME.

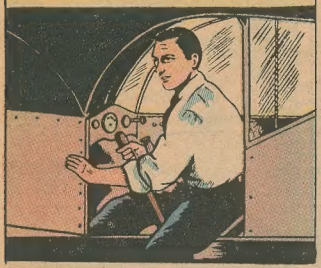
THANK YOU, SIR!

STANLEY STARTED THE ENGINE, THE TWO BLADES WHIRLED IN OPPOSITE DIRECTIONS... THEN.....

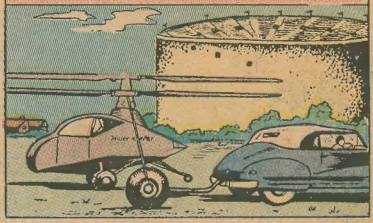
IT'S RISING.. IT WORKS!

HILLER CLIMBED INTO THE COCK-PIT OF HIS MACHINE WHICH WAS TIED TO AN AUTO.

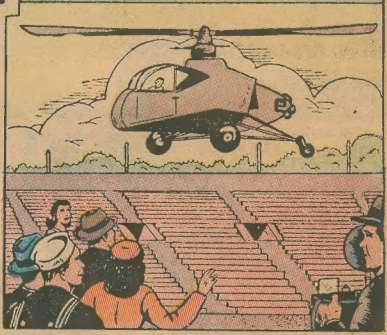
AFTER TESTING THE MACHINE, WHICH REPEATEDLY ROSE A FEW INCHES AND DESCENDED FOR A SOLID HOUR, HILLER WAS READY FOR THE NEXT TEST.



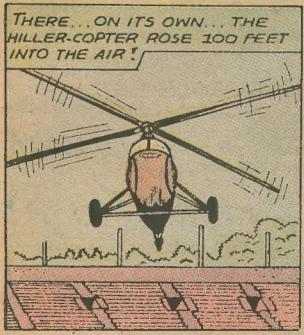
HILLER SECRETLY TOWED THE MACHINE TO THE EMPTY UNIVERSITY OF CALIFORNIA FOOTBALL STADIUM.



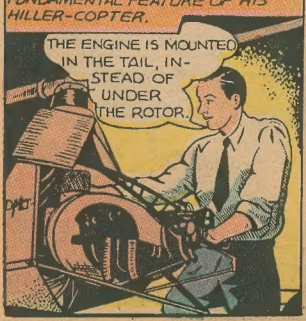
SINCE THEN, THE MACHINE HAS ATTAINED A SPEED OF 90 MILES PER HOUR IN PUBLIC TESTS....

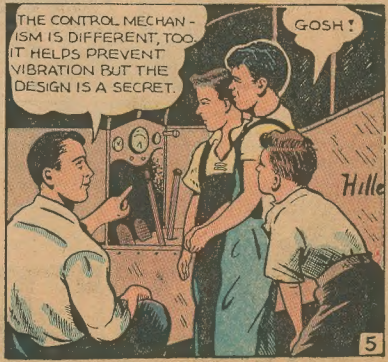


THERE... ON ITS OWN... THE HILLER-COPTER ROSE 100 FEET INTO THE AIR!



LATER... STANLEY POINTED OUT A FUNDAMENTAL FEATURE OF HIS HILLER-COPTER.





SHORTLY AFTERWARDS, 19-YEAR OLD STANLEY HILLER WAS SUMMONED TO THE OFFICE OF HENRY J. KAISER, THE FAMOUS SHIPBUILDER

YOU WANT TO SEE ME, MR. KAISER?

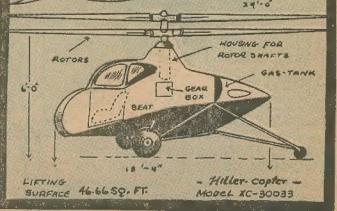
YES, STANLEY, I'D LIKE YOU TO WORK FOR ME!

YOU SEE, YOU'VE DESIGNED ONE OF THE BEST HELICOPTERS I'VE EVER SEEN AND KAISER CARGO CO. PLANS TO BUILD POST-WAR MACHINES!

HILLER, NOW 20, HAS ALREADY DESIGNED TWO MODELS.

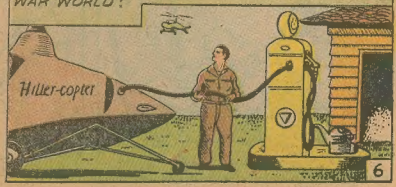
I'D LIKE YOU TO DESIGN ADDITIONAL HILLER-COPTERS FOR US.... EVEN BETTER THAN YOUR FIRST ONE

THIS IS A TWO-PASSENGER HILLER-COPTER, WHICH WILL TRANSPORT PASSENGERS AND BAGGAGE SHORT DISTANCES.



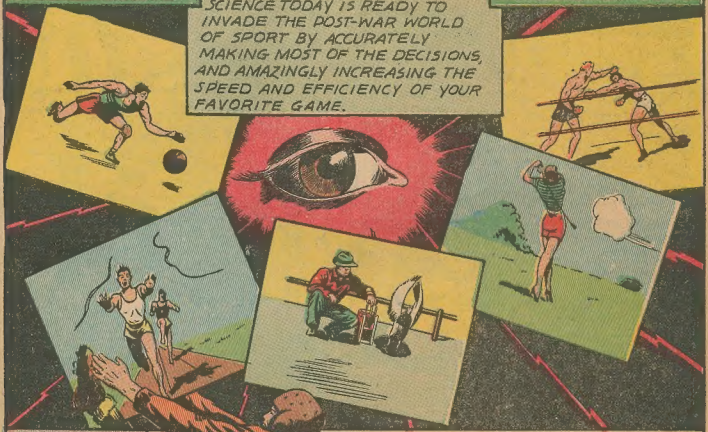
THIS MODEL IS LARGER AND CAN CRUISE FOR MILES.... EVEN EFFECT RESCUES AT SEA.

STANLEY HILLER, THE AMAZING BOY WIZARD OF AVIATION, WILL PROBABLY PRODUCE MORE SENSATIONAL HELICOPTERS IN THE FUTURE, AERIAL FLIVVERS OF THE POST-WAR WORLD!



SCIENCE INVADES the Sport World

CAPABLE OF ELIMINATING MUCH GUESSWORK IN ATHLETICS, SCIENCE TODAY IS READY TO INVADE THE POST-WAR WORLD OF SPORT BY ACCURATELY MAKING MOST OF THE DECISIONS, AND AMAZINGLY INCREASING THE SPEED AND EFFICIENCY OF YOUR FAVORITE GAME.



IN FOOTBALL, VICTORY OFTEN DEPENDS ON THE UMPIRE'S DECISIONS AS TO WHETHER A FIELD GOAL IS GOOD OR BAD.

BUT IT IS IMPOSSIBLE FOR THE HUMAN EYE TO BE ALWAYS 100% ACCURATE.

YET IN THE FUTURE, SCIENCE WILL BE ABSOLUTELY INFALLIBLE IN MAKING SIMILAR DECISIONS.

THAT TRANSMITTER FLASHES INVISIBLE ELECTRIC BEAMS, WHEN INTERCEPTED, RECORDS A GOAL!

GOLLY, WHO'D HAVE THOUGHT IT POSSIBLE!

SOON, WE'LL ALSO BE USING THE ELECTRIC EYE TO TELL WHETHER A TEAM IS OFFSIDE, OR A RUNNER OUT OF BOUNDS.

ALREADY IN FENCING, THE ELECTRIC BEAM IS EFFECTIVELY EMPLOYED.

IN EPEE CHAMPIONSHIPS, OUR FENCERS WEAR ELECTRIC UNIFORMS. WHICH, AT EVERY TOUCH, RELAYS A SIGNAL.

YEP, THAT'S RIGHT! NO GUESS-WORK NOW.

A FEW YEARS AGO, AT A CHAMPIONSHIP FINALS, EACH OF 6 CONTESTANTS WERE DISQUALIFIED FOR TWO FALSE STARTS!

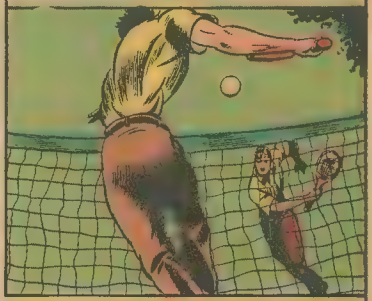
BUT HOW CAN WE DECIDE THE CHAMPION IF ALL OF US ARE DISQUALIFIED!

O.K., O.K., WE'LL TRY AGAIN!

TODAY - THIS COULD NOT HAPPEN. FOR SPRINTERS PLACE THEIR HANDS ON PLATES - AND THE ELECTRICALLY ATTACHED GUN WILL NOT FIRE IF A MAN DOES NOT HAVE HIS HAND ON THE PLATE.

EVEN THOUGH THE FINISH IS UNCERTAIN, TO THE HUMAN EYE, SCIENCE RECORDS EXACTLY THE ACCURATE RESULT.

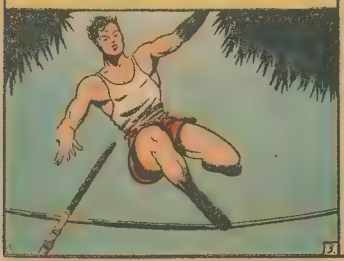
IN TENNIS, TOO, THE ELECTRIC EYE WILL QUICKLY FLASH OUTS AND FOOT AND SERVICE FAULTS.



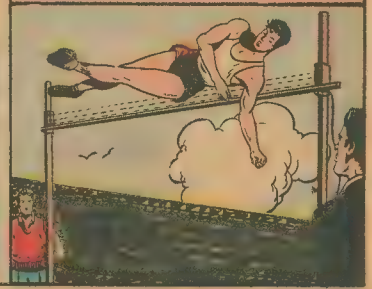
ON THE GOLF COURSE, FUTURE PLAYERS WILL FIND RADIO INDISPENSABLE.

YOU WILL WHIP OUT YOUR WALKIE-TALKIE, CONTACT THE OPERATOR, AND--

PREVIOUSLY, AT HIGH JUMP OR POLE VAULT MEETS, CONTESTS HAVE BEEN LOST WHEN IT HAS BEEN FOUND THE BAR SAGGED IN THE MIDDLE



BUT NOW, INVISIBLE BEAMS ABOVE THE CROSS BAR RECORD THE PRECISE HEIGHT OF EACH JUMP!



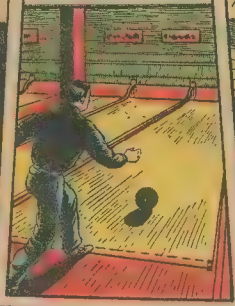
BASEBALL SEEMS TO BE THE ONE SPORT WHICH WILL BE LEAST AFFECTED BY THE MIRACLE OF THE ELECTRIC EYE ----

THE BATTER'S HAND OR BAT WOULD BREAK THE BEAM WHEN SWINGING AND WE COULDN'T TELL A BALL FROM A STRIKE!

HOWEVER, IN PRACTICE SESSIONS, THE ELECTRIC EYE CAN BE USED BY PITCHERS TO DETERMINE IF BALLS ARE GETTING DIRECTLY OVER THE PLATE.

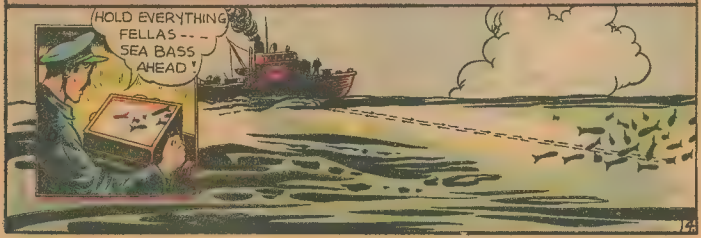
HERETOFORE, A GREAT DEAL OF GUESSWORK HAS ENTERED INTO DECISIONS AS TO WHETHER A BOWLER HAS STEPPED INTO THE ALLEY OR NOT.

BUT NOT TODAY! THE ELECTRIC EYE FLASHES ITS GUILTY SIGNAL IMMEDIATELY!



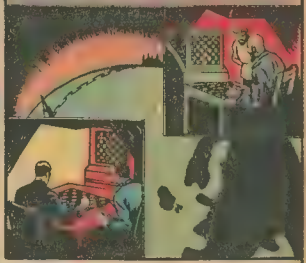
THE ELECTRIC EYE WILL REGISTER EACH SWIMMER'S TOUCHING THE POOL'S FAR END IN NATIONAL AND COLLEGIATE AQUATIC MEETS

RADAR AND FISHERMEN WILL SHORTLY BECOME BOON COMPANIONS BECAUSE SCHOOLS OF FISH WILL BE SPOTTED MILES AWAY!



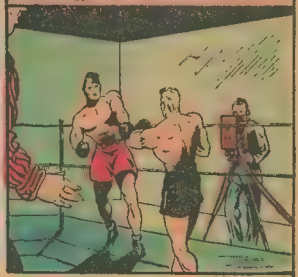
FOR MANY MONTHS, PROGRESSIVE RACE TRACKS HAVE USED THE ELECTRIC EYE CAMERA WHICH INSTANTLY PHOTOGRAPHS THE FIRST HORSE ACROSS THE FINISH LINE.

TELEVISION IS ALSO BEGINNING TO ENTER THE SPORTS WORLD, AND BEFORE LONG, INTERNATIONAL CHESS GAMES MAY BE DAILY EVENTS.

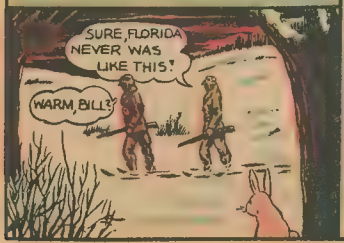


EXCITING SIX-DAY BICYCLE RACES MAY SOON BE BROUGHT BY TELEVISION TO THOUSANDS WHO NEVER BEFORE WITNESSED THIS SPORT.

MIKE JACOBS, FAMOUS BOXING PROMOTER, PREDICTS FUTURE FIGHTS CAN BE STAGED IN A SMALL ROOM TO A TELEVISION AUDIENCE OF MILLIONS.



IF IT'S COMFORT YOU WANT, YOU, SPORTSMEN OF THE FUTURE WILL ENJOY ELECTRIC SHOES, COATS, HELMETS AND GLOVES.



IN THE FUTURE, SCIENCE IS CERTAIN TO MAKE EVEN MORE STARTLING PROGRESS IN THE AMERICAN SPORTS WORLD ----- HELPING TO EVOLVE ATHLETICS MORE ACCURATELY, SPEEDIER, AND MORE ENJOYABLE THAN EVER BEFORE.

RAILROADS GO MODERN

SPEED... SAFETY.. ECONOMY.. THE BYWORD OF AMERICAN RAILROADS... WHICH HAVE ENLISTED THE AID OF FOREMOST SPECIALISTS OF SCIENCE AND INDUSTRY TO LAUNCH A MODERN, MIRACLE ERA OF SERVICE, UNSURPASSED ANYWHERE

GA

BACK IN 1857..THE ERIE R.R. INAUGURATED THE LONGEST LINE IN AMERICA..DANIEL WEBSTER SAT IN AN OPEN FLATCAR..HE DIDN'T WANT TO MISS ANYTHING NEW OR EXCITING.

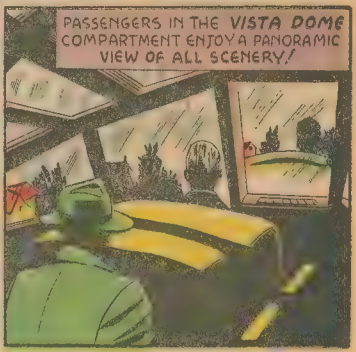
TODAY...IF DANIEL WEBSTER WERE TO EMBARK ON A TRAIN JOURNEY HE WOULD BE COMPLETELY AMAZED.. FOR THE RAILROADS HAVE GONE MODERN WITH A BANG!

ONE OF THE FIRST "TRAINS OF TOMORROW" THE NEW YORK CENTRAL'S ***EMPIRE STATE EXPRESS***.. AN ALL COACH DE LUXE STAINLESS STEEL GIANT ON WHEELS..WAS PUT INTO SERVICE BETWEEN NEW YORK CITY AND DETROIT..THE DAY AFTER THE START OF WORLD WAR II !

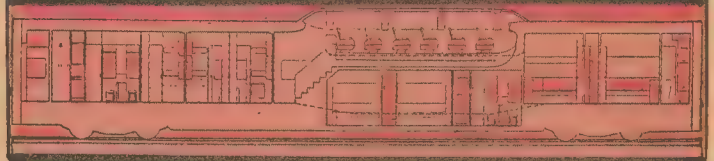
THE LAST STREAMLINER OF THE WAR WAS INAUGURATED IN 1942 ... THE ILLINOIS CENTRAL'S ***PANAMA LIMITED***.. AN ULTRA MODERN TRAIN OPERATING BETWEEN NEW ORLEANS AND CHICAGO.

THE REVOLUTIONARY ***VISTA-DOME CAR*** WAS ALSO INTRODUCED DURING THE WAR BY THE BURLINGTON SYSTEM.. SCORING AN INSTANTANEOUS SUCCESS!

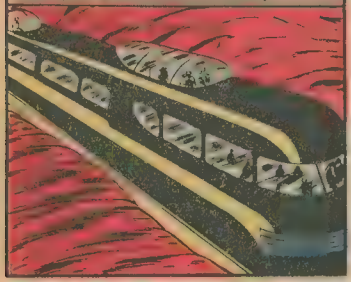
PASSENGERS IN THE ***VISTA DOME*** COMPARTMENT ENJOY A PANORAMIC VIEW OF ALL SCENERY!



GENERAL MOTORS..WHICH ORIGINATED THE DOME CAR ALREADY HAS A NEW ***ASTRA DOME*** SLEEPING CAR IN CONSTRUCTION.. AND HERE IS THE FLOOR PLAN ...

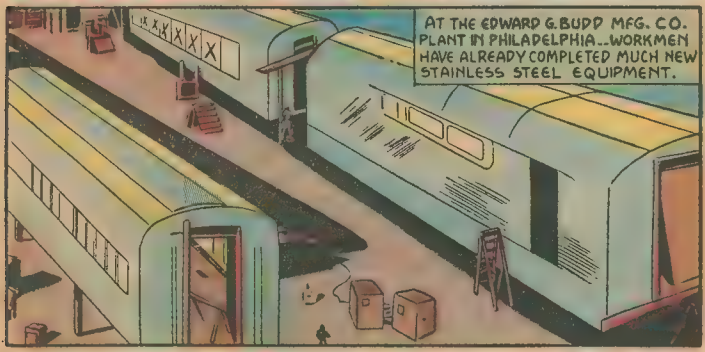


THE **ASTRA DOME** SLEEPING CARS WILL BE INCORPORATED IN A NEW GENERAL MOTORS UNIT WHICH WILL INCLUDE **ASTRA LINER** LOUNGES AND DINING CARS!

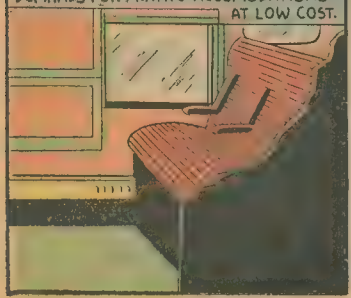


LEAPING FROM THE DRAFT BOARDS OF AMERICAN DESIGNERS--- SCORES OF STARTLING NEW RAILROAD CARS WILL BE IN USE WITHIN THE NEXT YEAR!

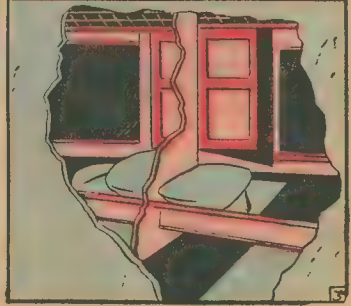
AT THE EDWARD G. BUDD MFG. CO. PLANT IN PHILADELPHIA...WORKMEN HAVE ALREADY COMPLETED MUCH NEW STAINLESS STEEL EQUIPMENT.

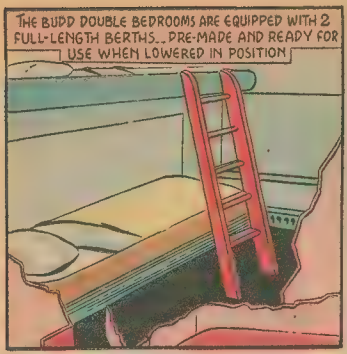


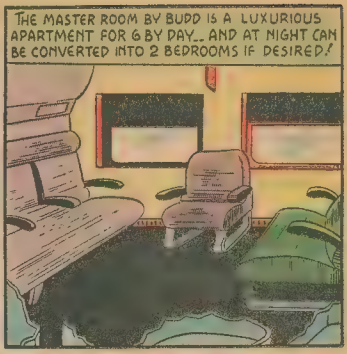
THE BUDD BUDGETTE, A SLEEPING CAR WITH 32 ROOMS ON 2 LEVELS... ANSWERS POPULAR DEMANDS FOR PRIVATE ACCOMODATIONS AT LOW COST.



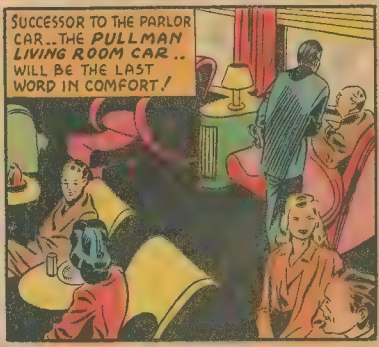
THIS IS HOW BUDGETTE ROOMS LOOK MADE UP FOR NIGHT USE.

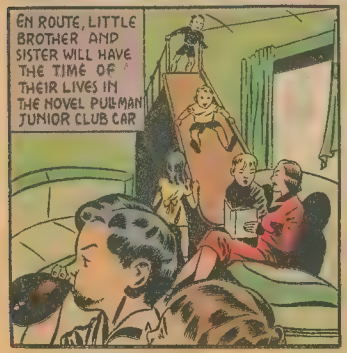


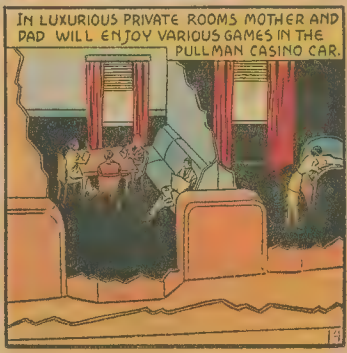

THE BUDD DOUBLE BEDROOMS ARE EQUIPPED WITH 2 FULL-LENGTH BERTHS... PRE-MADE AND READY FOR USE WHEN LOWERED IN POSITION

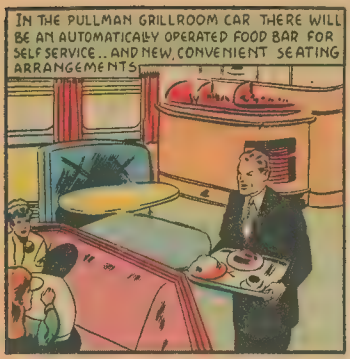

THE MASTER ROOM BY BUDD IS A LUXURIOUS APARTMENT FOR 6 BY DAY... AND AT NIGHT CAN BE CONVERTED INTO 2 BEDROOMS IF DESIRED!

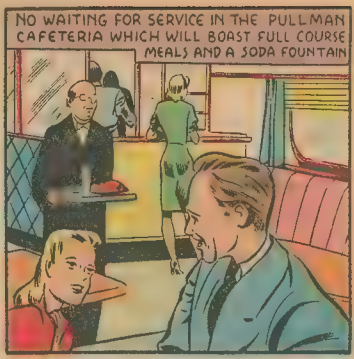
PULLMAN-STANDARD WILL SHORTLY INTRODUCE A 3 TIER SLEEPER IN A 42 SECTION CAR... CATERING TO LIMITED BUDGETS.

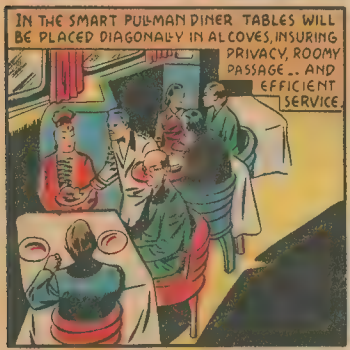

SUCCESSOR TO THE PARLOR CAR... THE PULLMAN LIVING ROOM CAR .. WILL BE THE LAST WORD IN COMFORT!

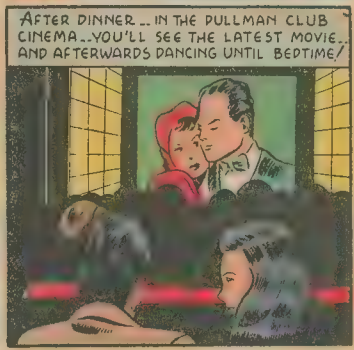

EN ROUTE, LITTLE BROTHER AND SISTER WILL HAVE THE TIME OF THEIR LIVES IN THE NOVEL PULLMAN JUNIOR CLUB CAR

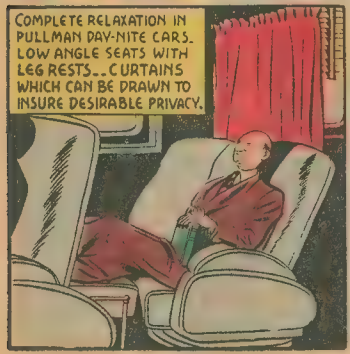

IN LUXURIOUS PRIVATE ROOMS MOTHER AND DAD WILL ENJOY VARIOUS GAMES IN THE PULLMAN CASINO CAR.

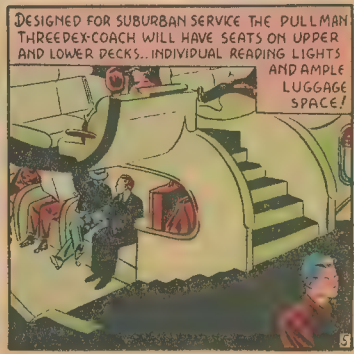

IN THE PULLMAN GRILLROOM CAR THERE WILL BE AN AUTOMATICALLY OPERATED FOOD BAR FOR SELF SERVICE.. AND NEW, CONVENIENT SEATING ARRANGEMENTS


NO WAITING FOR SERVICE IN THE PULLMAN CAFETERIA WHICH WILL BOAST FULL COURSE MEALS AND A SODA FOUNTAIN

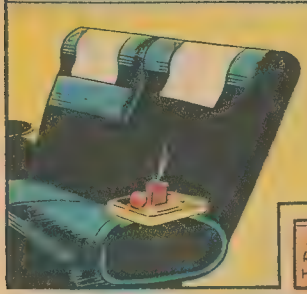

IN THE SMART PULLMAN DINER TABLES WILL BE PLACED DIAGONALLY IN ALCOVES, INSURING PRIVACY, ROOMY PASSAGE ... AND EFFICIENT SERVICE


AFTER DINNER ... IN THE PULLMAN CLUB CINEMA ..YOU'LL SEE THE LATEST MOVIE.. AND AFTERWARDS DANCING UNTIL BEDTIME!


COMPLETE RELAXATION IN PULLMAN DAY-NITE CARS. LOW ANGLE SEATS WITH LEG RESTS... CURTAINS WHICH CAN BE DRAWN TO INSURE DESIRABLE PRIVACY.


DESIGNED FOR SUBURBAN SERVICE THE PULLMAN THREEDEX-COACH WILL HAVE SEATS ON UPPER AND LOWER DECKS.. INDIVIDUAL READING LIGHTS AND AMPLE LUGGAGE SPACE!

IN THE LUXURIOUS **SLUMBERLINER COACH**.. DESIGNED BY THE AMERICAN CAR FOUNDRY CO. EACH SEAT WILL HAVE FOLDING ARM TRAYS!



A BOON TO CHILDREN WILL BE THE AMERICAN CAR AND FOUNDRY COMPANY'S NEWLY DESIGNED SWINGING HANDRAILS AND MECHANICALLY OPERATED VESTIBULE DOORS.

TO DAY... MANY DE LUXE TRAINS OFFER AUTOMATIC EXCHANGE TELEPHONE SERVICE FOR PASSENGERS!

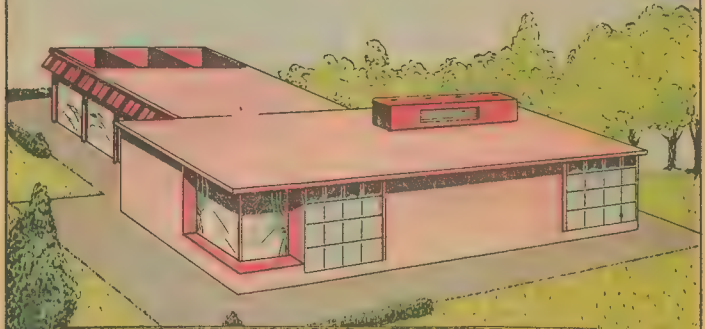
RECENTLY PERFECTED METHODS NOW ENABLE TELEPHONIC COMMUNICATION BETWEEN THE ENGINEER AND TRAIN CREW... ESTABLISHING A NEW HIGH FOR SAFETY!

EVEN THE TRACKS HAVE UNDERGONE A CHANGE, SCIENTISTS HAVING DISCOVERED THAT HIGH SPEED TRAINS NEED ESPECIALLY DESIGNED TRACKS.

THANKS TO THE FORESIGHT AND PROGRESSIVENESS OF AMERICAN RAILROADS, TRAVEL TODAY IS A 100% PLEASURE... BECAUSE FROM THE INSTANT THE MODERN PASSENGER BOARDS A TRAIN... HIS VACATION BEGINS!

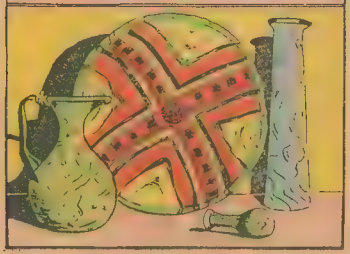
TESTING STAMINA AT
HARVARD LABORATORY.

GLASS WONDERS

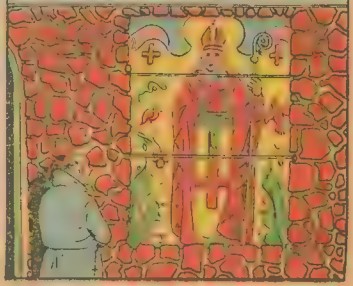


ALTHOUGH OUR DAILY USE AND CONTACT WITH GLASS OBJECTS HAS DULLED OUR INTEREST TO SUCH AN EXTENT, THAT WE TAKE ITS PRESENCE FOR GRANTED, RECENT DEVELOPEMENTS HAVE MADE GLASS AN ULTRA-MODERN WONDER!

GLASS HAD BEEN KNOWN TO THE EGYPTIANS AS EARLY AS 2,000 YEARS B.C.—THE GREEKS, ASSYRIANS, PHOENICIANS AND ESPECIALLY THE ROMANS MADE BEAUTIFUL OBJECTS FROM IT---



BUT, NOT UNTIL THE THIRD CENTURY A.D. DID ANYONE USE GLASS FOR WINDOWS, AND THEN ONLY FOR CHURCHES---

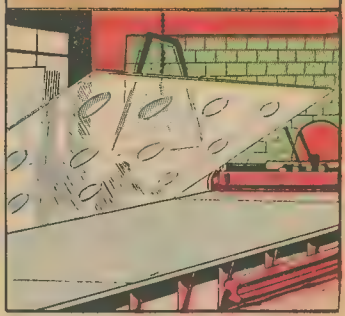


IT WAS NOT UNTIL 647 A.D. THAT GLASS WINDOWS WERE INTRODUCED INTO ENGLAND BY BENEDICT BISCOP---

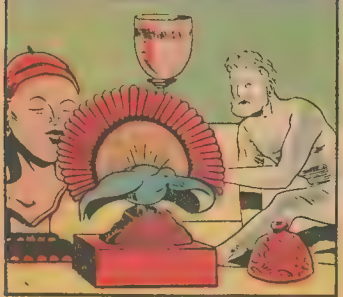
THE GLASS INDUSTRY, THE OLDEST IN THE U.S., HAD ITS BEGINNING IN JAMESTOWN, VA., IN 1609, WHEN CAPT. JOHN SMITH OPENED A SMALL FACTORY MAKING BEADS AND BOTTLES---

GLASS IS FORMED BY THE FUSION OF POWDERED FLINT OR FINE SAND WITH ALKALINE EARTH, SALT OR METALLIC OXIDES. THERE IS NO OTHER MATERIAL WHICH HAS AS MANY USES AS GLASS. THERE ARE ABOUT 1000 DIFFERENT KINDS OF GLASS, MORE THAN ALL METALS AND ALLOYS COMBINED!--THE MOST WIDELY KNOWN TYPES ARE: BOTTLE OR GREEN (LIME) GLASS---

--PLATE GLASS---



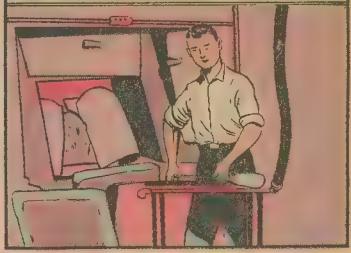
--AND FLINT OR CRYSTAL GLASS---



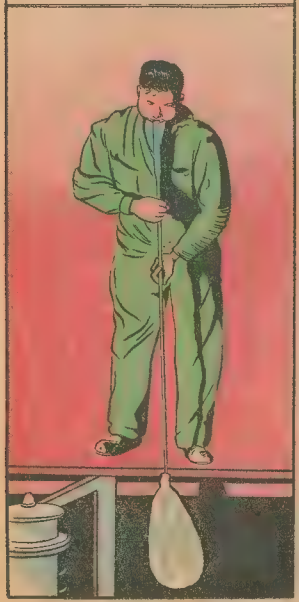
AUTOMATIC MACHINES NOW PRODUCE MOST OF THE INDUSTRY'S GOODS. HOWEVER, ONLY THE SKILLED GLASS BLOWER CAN TURN OUT THE DELICATE TABLEWARE, ORNAMENTAL OBJECTS AND PRECISION WARE USED IN LABORATORIES--

After the ingrediences have been fused in huge electric furnaces, a workman, called the „gatherer" dips the knob-end of the long blow pipe into the molten glass and lifts out a „gather"---

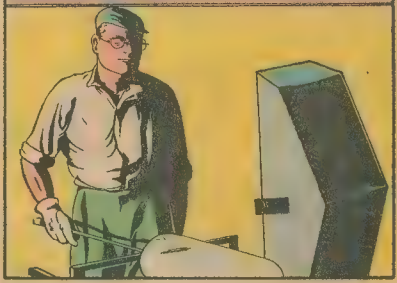
He then hands the pipe to another workman, the „ball-holder", who, by a series of twists and blowing, shapes the lump into its initial hollow form ---



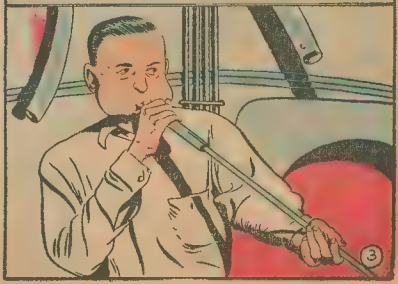
The „coverer" then adds more glass to the pipe and hands it to the most important member of the blowing team, the „gaffer"--



After the „gaffer's "skill has formed the object, the pipe is handed to the „crack-off boy"---

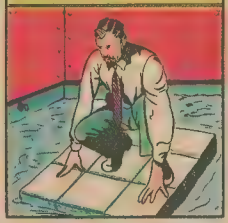


It takes powerful lungs and expert breath control to practice the art of glass blowing---

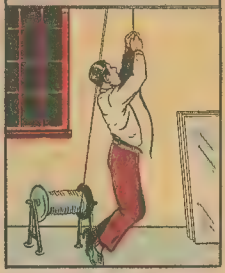


SINCE THE TURN OF THE CENTURY THE GLASS INDUSTRY HAS MADE GREAT STRIDES. TODAY, GLASS IS MADE WHICH CAN BE BENT, TWISTED, WOVEN AND SAWED!

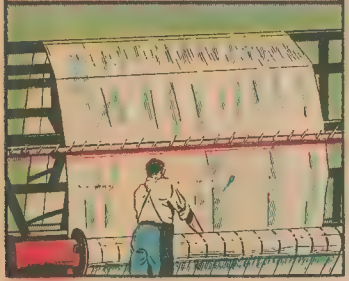
THE RIGID, BRITTLE CHARACTERISTICS OF GLASS HAVE BEEN ALMOST ELIMINATED. IT CAN BE BULLET AND SHOCK PROOF, CAN BE FORMED INTO „FOAMGLASS", WHICH FLOATS!



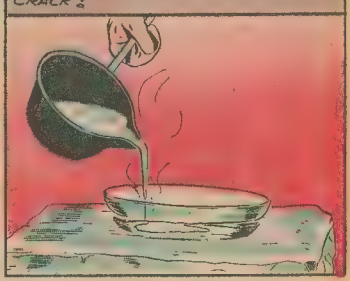
IT CAN BE TWISTED INTO STRANDS THREE TIMES THE TENSILE STRENGTH OF MANILA ROPE!



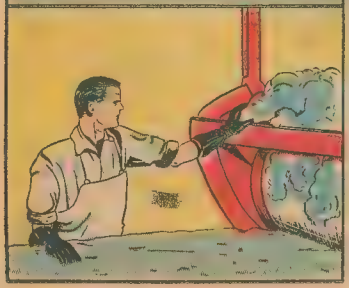
—IT CAN BE SPUN INTO A FINE YARN AND WOVEN INTO SMOOTH, FIRE PROOF, SILK-LIKE FABRICS!



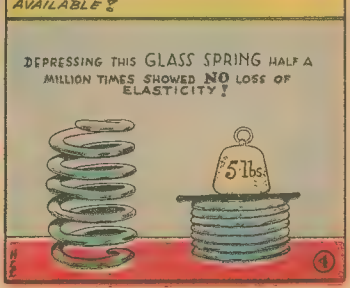
—IT CAN BE MADE TO RESIST HEAT TO SUCH AN EXTENT, THAT EVEN IF MOLTEN METAL IS POURED ON IT, IT WILL NOT CRACK!

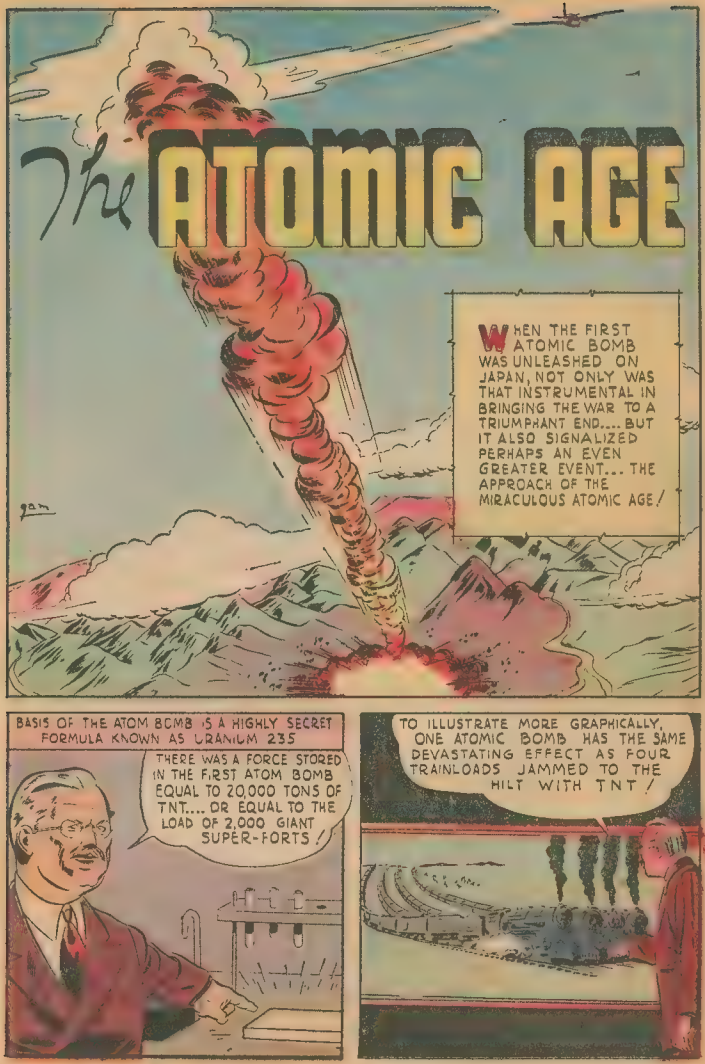


—IT CAN BE SPUN INTO A WOOL-LIKE BATTING, WHICH FINDS EXTENSIVE USES IN THE INSULATION OF SHIPS AND HOUSES!



A TYPE OF GLASS HAS BEEN MADE WHICH IS ALMOST UNBREAKABLE, AND, WONDER OF WONDERS, ELASTIC GLASS IS NOW AVAILABLE!




The ATOMIC AGE
WHEN THE FIRST ATOMIC BOMB WAS UNLEASHED ON JAPAN, NOT ONLY WAS THAT INSTRUMENTAL IN BRINGING THE WAR TO A TRIUMPHANT END.... BUT IT ALSO SIGNALIZED PERHAPS AN EVEN GREATER EVENT... THE APPROACH OF THE MIRACULOUS ATOMIC AGE!
BASIS OF THE ATOM BOMB IS A HIGHLY SECRET FORMULA KNOWN AS URANIUM 235
THERE WAS A FORCE STORED IN THE FIRST ATOM BOMB EQUAL TO 20,000 TONS OF TNT.... OR EQUAL TO THE LOAD OF 2,000 GIANT SUPER-FORTS!
TO ILLUSTRATE MORE GRAPHICALLY, ONE ATOMIC BOMB HAS THE SAME DEVASTATING EFFECT AS FOUR TRAINLOADS JAMMED TO THE HILT WITH TNT!

BUT WHEN WE CONVERT ATOMIC POWER TO PEACETIME USE.... OUR ENTIRE MODE OF LIFE WILL BE COMPLETELY REVOLUTIONIZED!

IF AUTOMOBILES OF THE FUTURE LAST THAT LONG.... THEY COULD TRAVEL 5,000,000 MILES ON ONE SMALL PELLET OF URANIUM!

GIGANTIC ROCKET SHIPS MAY BE ABLE TO FLY A THOUSAND MILES PER HOUR WITH ATOMIC POWER!

URANIUM CAN PROVIDE POWER FOR PRIVATE HOMES AT LESS THAN ONE TENTH A CENT PER KILOWAT HOUR!

JUNIOR, PLEASE PUT AN ATOMIC WAFER IN THE POWER BOX, WILL YOU, DEAR?

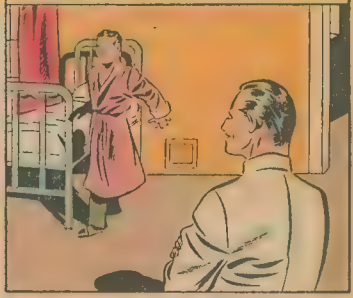
OF COURSE MOTHER!

ATOMIC POWERED INDUSTRY WILL TURN OUT CONSUMER GOODS AT PRICES UNBELEVABLY BELOW TODAYS LEVELS!

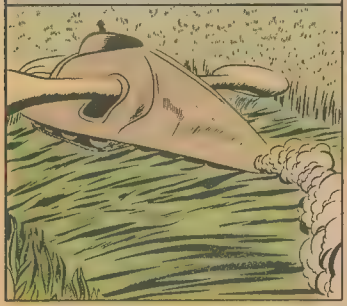
GIANT OCEAN LINERS, TRANSPORTING THOUSANDS OF PERSONS.... WILL USE ATOMIC POWER TO RACE ACROSS THE SEAS AT A SPEED RIVALING THAT OF THE AIRPLANE!

STREAMLINED RAILROADS WILL SAFELY ZOOM FROM COAST TO COAST IN AN HOUR'S TIME!

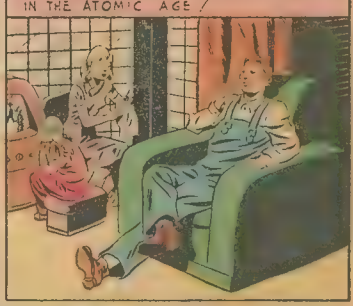
SCIENTISTS HOPE THAT ATOMIC ENERGY MAY AID IN CONQUERING AND CONTROLLING MANY DISEASES.

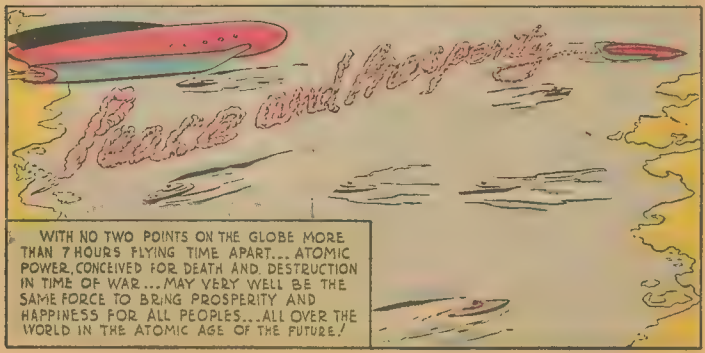


ATOMIC POWER MAY ALSO HELP THE FARMER HARVEST HIS CROPS CHEAPLY AND QUICKLY



RURAL HOMES...NO MATTER HOW REMOTE, WILL HAVE AUTOMATIC HEAT, FUEL AND LIGHT IN THE ATOMIC AGE!




WITH NO TWO POINTS ON THE GLOBE MORE THAN 7 HOURS FLYING TIME APART... ATOMIC POWER, CONCEIVED FOR DEATH AND DESTRUCTION IN TIME OF WAR... MAY VERY WELL BE THE SAME FORCE TO BRING PROSPERITY AND HAPPINESS FOR ALL PEOPLES... ALL OVER THE WORLD IN THE ATOMIC AGE OF THE FUTURE!

Hero of Science

The Gestapo had a list of wanted men. High on that list stood the name of Dr. Ernest Boris Chain. Why did they want Dr. Chain so badly? First, because he was of the Jewish faith, and had fled from their clutches back in 1933. Second, because he had helped discover and give to the *civilized* world the wonderful drug, penicillin. That made the Nazis mad. Why should Dr. Chain save the lives of countless thousands in the hated democracies while real Nazis were compelled to use inferior, dangerous remedies inside their own precious skins? The fact that they would have tortured and killed him if they had ever laid hands on him didn't alter their sense of grievance.

Dr. Chain got out in time. But his 75-year-old mother and his sister were not so fortunate. The Gestapo took their vengeance on these innocent women. They hustled them off to the dreadful concentration camp at Teresienstadt and that was the last that was ever heard of them.

The English welcomed Dr. Chain with open arms. They knew his ability and didn't worry about differences in religion. For the young man was one of the greatest bio-chemists in the world. Even as a little boy he had hung around his father's laboratory in Berlin and vowed that some day he too would be a fine chemist like his parent. And, as not always happens, the boy made good on his vow.

At Cambridge University in England, where Dr. Chain was promptly appointed a lecturer, he teamed up with Dr. Howard Florey in a series of startling researches. There were certain terrible bacterial diseases that caused millions of deaths annually all over the world. Among these were pneumonia, meningitis, streptococcus infections, and bacterial myocarditis, a fatal heart condition. Up to recently no specific cure had been found. Then came the sulfa drugs. But these were dangerous and, in a good many cases, did more harm to the patient than good. The problem then was to find some new drug that would be both safe and powerful. The two scientists went to work at once.

They tried all sorts of substances. Some were worthless, some were partly effective; none of them hit the mark.

Dr. Florey was discouraged. "I'm afraid we've failed," he told Chain. But the young scientist refused to give up. "We'll just keep on trying," he replied.

One day, after a hard day's work in the laboratory, Chain was reading through some old scientific paper to see if he could come across something interesting. Most of them were pretty dull, even for a scientist; and Chain kept leafing along. Suddenly he stopped and his eyes glued to the faded print. He read on, raptly, absorbed. Then, with a cry of joy, he leaped to his feet. It was night, and bitter cold outside. Yet, bareheaded and coatless as he was, he ran to where Florey lived. Late passersby, huddled against the wind in heavy coats, looked with amazement at the bareheaded, running man, with the sheets of paper whipping in his frozen fingers.

Chain burst breathless in upon his startled colleague.

"What's happened?" cried Florey in alarm.

"I—I think I've found it!" gasped Chain. "Here, read this. No, let me tell you. You've heard of Alexander Fleming?"

Florey nodded. "Of course. He's done a lot of work in our field."

"Well, here's a paper by him, written about twelve years ago. It seems he wondered why the bodies of people who had died of infectious diseases, soon after they were buried were wholly free of the bacteria that killed them. Then he noted that these bodies were covered with penicillium mold—you know the common green

mold that shows up on stale bread. He tried some of the mold and found it produced a powerful anti-bacterial substance."

"Sounds interesting. Did he do anything more?"

"No, he dropped his experiments at that point."

"I don't know," said Florey doubtfully. "We have plenty of very fine germicides. The whole problem is to find one that won't kill the patient with the bacteria."

"That's just my hunch about this mold," retorted Chain. "I remember that peasant people used to put poultices of stale, soaked bread on cuts and wounds. They claimed it actually healed. I bet it was the mold which grew on the bread that did the trick."

"It might be," Florey admitted. "When do we start?"

"Immediately."

AN EAGER TEAM

The first thing the two scientists did was to develop a team of eager loyal assistants. Among these were Dr. E. P. Abraham, Dr. A. G. Sanders, Dr. Margaret Jennings and others. But money was required, and the researchers had none. They managed to get small sums of money—not more than $100 at a time—and from this they had to buy equipment, chemicals, and pay salaries! There were periods when the ardent scientists were penniless and close to starvation. But their indomitable scientific spirit kept them going. Here was a chance to do something for suffering humanity—and they would not permit physical discomforts to stand in the way. At one time, however, they were so deeply in debt, and the chemical firms refused to give them any more credit, that the whole project was threatened with disaster.

Chain said despairingly to Florey: "We're so close to a solution; yet we'll have to quit."

"Let's ask the Rockefeller Foundation for a grant," said Florey. They did; and, lo and behold! the sum of $1,280 came through. With this munificent grant—at a time when war was costing hundreds of millions a day—they finished their work.

Chain isolated a dark, brown powder from the mold. Dissolved in water, the powder was injected into diseased mice. Within 24 hours the mice were scampering around, healthy and hungry for some appetizing cheese.

They tried it on human beings. A young boy whose blood was so poisoned everyone gave him up for dead walked out of the hospital wholly cured.

They had won their race against death. They had found penicillin, the magic mold, the greatest cure-all in the history of science since the famous discoveries of Pasteur. Millions of men, women and children, who before would have been condemned to sure death, now survive, thanks to the unselfish and devoted efforts of these great men.

Since Ernest Boris Chain and his colleagues are scientists, and not interested in making money, they refused to patent their drug. Instead, they gave it freely and without royalties to the world at large.

Only in Germany did the Nazis refuse to heed the tales of this marvelous new germicide. "Ha!" they sneered. "The whole thing's a trick by that Jew, Dr. Chain. He thinks we'll stop using sulfa drugs and try this poison of his. We're too smart to be fooled! And if we ever get hold of him—!"

So diseased Nazis continued to die, and freedom-loving people were restored to health and usefulness.

Dr. Chain was in America on a British medical mission when the telephone rang in his hotel room. A voice said: "Dr. Chain, let me be the first to congratulate you! You've just been awarded—together with Dr. Fleming and Dr. Florey—the Nobel Prize." The reporter heard Chain's incredulous response: "You're fooling, whoever you are! Please don't bother me."

But it was true. The world of science had recognized his achievements and had hastened to acknowledge its gratitude by this substantial award. Dr. Chain, however, does not intend to rest on his laurels. As soon as he returns to England he will start on his next research—a cure for tuberculosis.

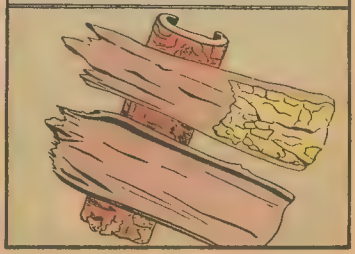
END

QUININE SYNTHETIC

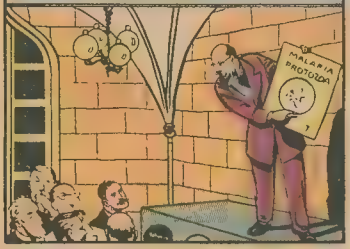
TWO YOUNG SCIENTISTS, WHOSE NAMES WILL LIVE FOREVER, HAVE GIVEN US, AFTER 14 MONTHS OF TOIL AND HEARTBREAK, SYNTHETIC QUININE, THE NATURAL SUPPLY OF WHICH WE LOST THROUGH JAPANESE TRICKERY.

AMONG THE HEALING DRUGS DERIVED FROM PLANT LIFE, QUININE IS ONE OF THE MOST IMPORTANT. FOR CENTURIES THE PERUVIAN BALSAM WAS ITS ONLY SOURCE UNTIL, WITH CAREFULLY SELECTED SEEDS - - -

- - - THE DUTCH STARTED CINCHONA TREE PLANTATIONS IN THE EAST INDIES ON A BIG SCALE. SKILLFUL GRAFTING INCREASED THE QUININE CONTENTS OF THE BARK TO 7% - - -



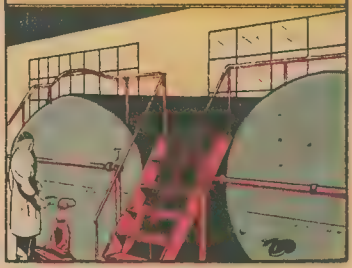
THE IMPORTANCE OF QUININE BECAME EVEN MORE PRONOUNCED, WHEN PROF. BINZ OF BONN, DEMONSTRATED THAT THE DRUG WAS DEADLY TO MALARIA PARASITES - - -



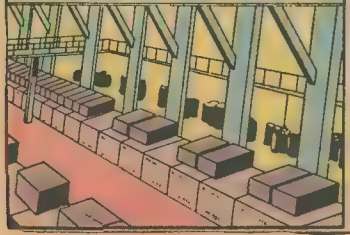
THE BARK OF THE CINCHONA TREE CONTAINS ABOUT 30 ALKALOIDS OF WHICH QUININE, QUINIDINE AND CINCHONINE ARE OFFICIALLY RECOGNIZED. THE BARK IS REMOVED BY VIGOROUS MALLETING -

- AND THEN DRIED, AS IT CONTAINS 70% WATER, PACKED INTO 200 lb BALES, AND SHIPPED TO QUININE FACTORIES - - -

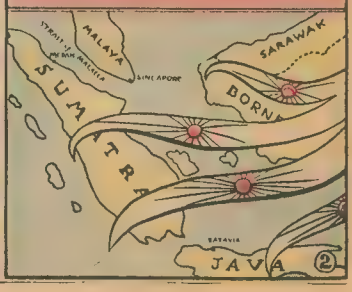
THE PULVERIZED BARK, RESEMBLING CINNAMON, IS THEN MIXED WITH WATER AND BOILED IN GREAT VATS, AFTER A KIND OF KEROSENE HAS BEEN ADDED -



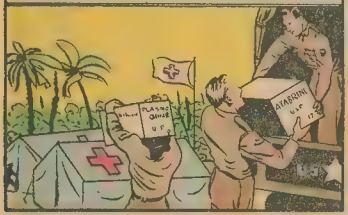
THE OIL ABSORBS THE QUININE WHICH IS THEN EXTRACTED BY THE INTRODUCTION OF SULPHURIC ACID. - THE REFINED PRODUCT COMBATS THE RAVAGES OF MALARIA AND JUNGLE FEVERS - - -



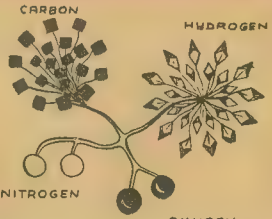
UP TO THE JAPANESE OCCUPATION 90% OF OUR QUININT SUPPLY CAME FROM THE DUTCH EAST INDIES - -



THE PROSPECT OF FIGHTING THE ENEMY IN FEVER-INVESTED JUNGLES WITHOUT THE PROTECTION OF QUININE, WAS NOT A ROSY ONE. ALTHOUGH OUR ARMY DOCTORS FOUGHT JUNGLE FEVERS WITH ATABRINE AND PLASMOCHINE THE RESULTS WERE NOT THE SAME ---



THE SCIENTIST STRECKER ESTABLISHED THE MAKE-UP OF THE QUININE MOLECULE AS CONSISTING OF 48 ATOMS ---



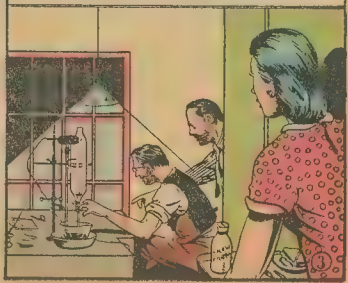
HOWEVER, FOR MORE THAN A CENTURY THE BEST MINDS IN CHEMISTRY TRIED IN VAIN TO PRODUCE THE DRUG ARTIFICIALLY, ONLY THE CINCHONA TREE COULD ARRANGE THE COMPLEX PATTERN TO FORM QUININE!

IN 1856 SIR WM. HENRY PERKINS DEMONSTRATED THAT QUININE COULD NOT BE SYNTHETIZED BY COMBINING THE CORRECT NUMBER OF CHEMICAL ATOMS. --DURING HIS EXPERIMENTS, PERKINS ACCIDENTALLY PRODUCED THE SYNTHETIC DYE MAUVE WHICH STARTED THE COAL-TAR CHEMICAL INDUSTRY.

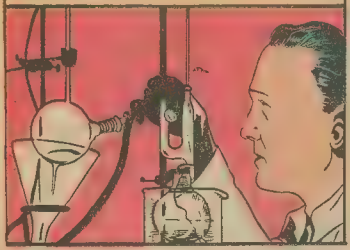
THEN IN 1942 THE POLAROID CORPORATION AT CAMBRIDGE, MASS., ASKED YOUNG ROBERT BURNS WOODWARD TO TRY SOLVE THIS PROBLEM ---

THE 26 YEAR OLD CHEMICAL WIZARD, WHO WON HIS PH.D. AT THE AGE OF 20, AFTER ONLY 4 YEARS OF COLLEGE WORK, ASKED 25-YEAR OLD WILLIAM VON EGGERS DOERING, WHOM HE MET AT HARVARD, TO JOIN HIM ---

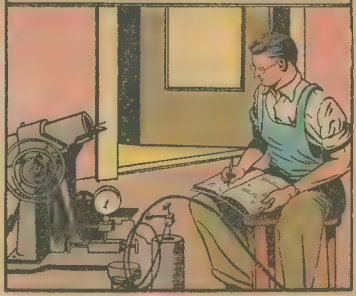
WOODWARD AND DOERING WORKED CEASELESSLY FOR MANY MONTHS, OFTEN FORGETTING SLEEP AND FOOD--



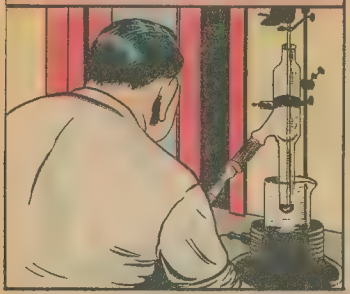
TIME AFTER TIME THEY WERE ON THE VERGE OF SUCCESS, ONLY TO DISCOVER THEY HAD MISSED AGAIN. THEN ON THE NIGHT OF EASTER, WHILE DOERING WAS WORKING ---



--AND WOODWARD WAS BUSY IN AN ADJOINING ROOM ---



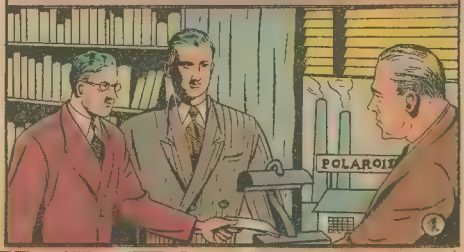
--DOERING SUDDENLY CRIED OUT "BOB, WE'VE GOT IT!"



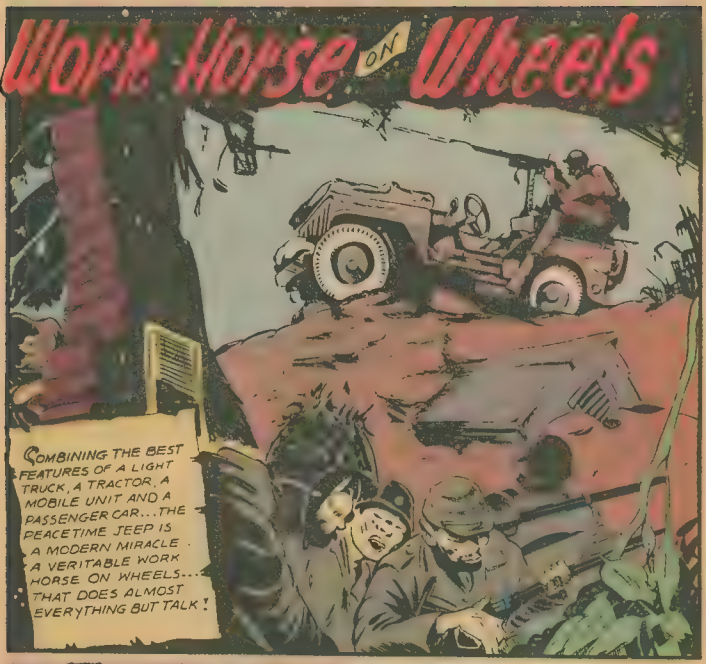
ALTHOUGH THEY NEVER DOUBTED THE ULTIMATE SUCCESS OF THEIR VENTURE, THE TWO YOUNG SCIENTISTS WERE MORE THAN ELATED ---

AND THUS, BY A SERIES OF INTRICATE AND DELICATE STEPS, THE YOUNG CHEMISTS HAD SUCCEEDED WHERE SCORES OF MORE EXPERIENCED SCIENTISTS HAD FAILED. THEY HAD PRODUCED A SYNTHETIC QUININE WHICH WAS THE EXACT DUPLICATE OF THE NATURAL PRODUCT! THEY HAD ALSO SUCCEEDED IN PRODUCING SYNTHETIC QUINIDINE, AN EXCEEDINGLY RARE DRUG USED IN THE TREATMENT OF HEART AILMENTS!

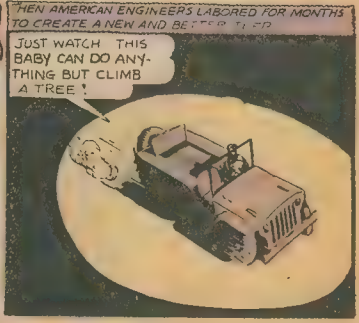
THE FOLLOWING DAY, AFTER CAREFULLY RE-CHECKING THEIR EXPERIMENTS, WOODWARD AND DOERING SUBMITTED THEIR FINDINGS TO EDWIN H. LAND, PRESIDENT OF POLAROID, WHO ON MAY 3rd, 1944 ANNOUNCED IT TO THE WORLD!



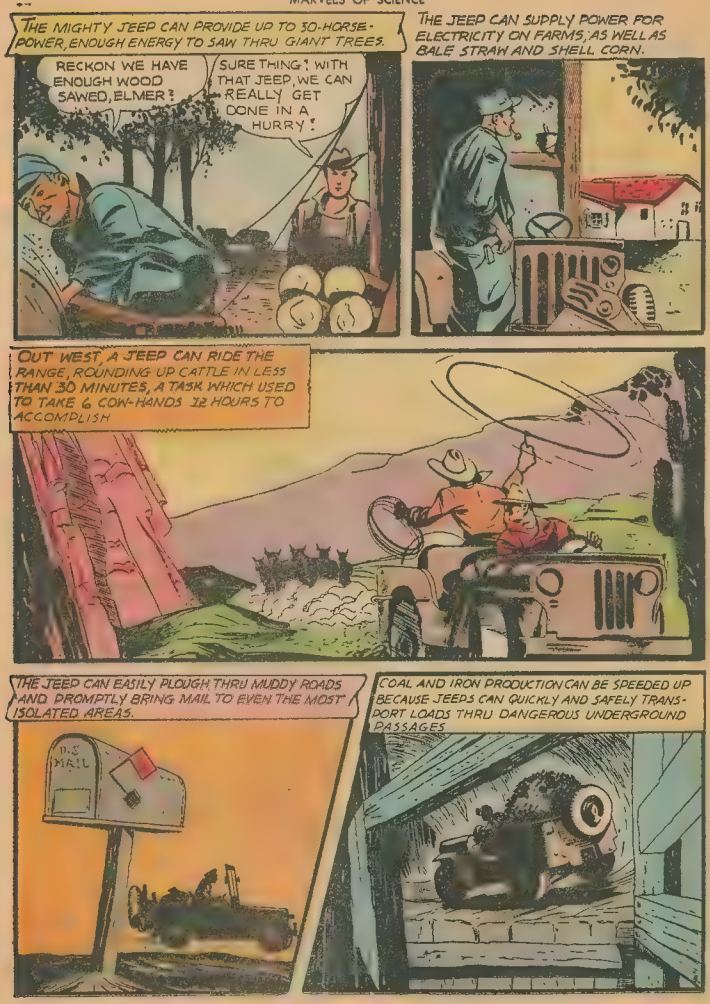
Work Horse ON Wheels


COMBINING THE BEST FEATURES OF A LIGHT TRUCK, A TRACTOR, A MOBILE UNIT AND A PASSENGER CAR...THE PEACETIME JEEP IS A MODERN MIRACLE . A VERITABLE WORK HORSE ON WHEELS... THAT DOES ALMOST EVERYTHING BUT TALK!

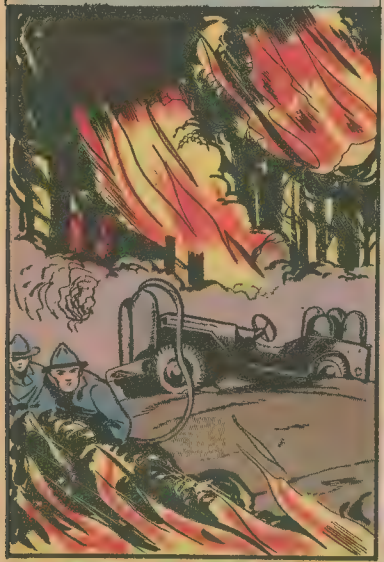
BORN DURING THE WAR, THE JEEP PERFORMED UNHEARD OF WONDERS ON ALL BATTLE FRONTS AND ACQUITTED ITSELF WITH HIGH DISTINCTION


WHEN AMERICAN ENGINEERS LABORED FOR MONTHS TO CREATE A NEW AND BETTER TYPE
JUST WATCH THIS BABY CAN DO ANY-THING BUT CLIMB A TREE!

LATER
SHE TOOK OFF AS EASILY AS A BIRD
OF COURSE, WE'VE INSTALLED A NEW GEAR SHIFT.
I HAD NO IDEA THE JEEP WAS SO FAST!
SURE IT HAS A CRUISING SPEED OF 60 MILES PER HOUR.
STILL LATER
TRAVELLING IN A JEEP USED TO BE LIKE RIDING A MULE NOW THEY HAVE SHOCK ABSORBERS AND SPRINGS IN THE SEATS
AND I LIKE THE TOP WHICH CAN BE RAISED IN BAD WEATHER.
TODAY, THESE NEW JEEPS ARE PERFORMING HERCULEAN TASKS ON FARMS AND IN FACTORIES
ON FARMS IT IS SAVING TIME AND MONEY THRESHING WHEAT SO QUICKLY
ENTIRE ORCHARD CAN BE SPRAYED QUICKLY WITH AN ATTACHMENT THAT CAN BE CARRIED IN THE JEEP
GOLDEN GLOW FRUIT

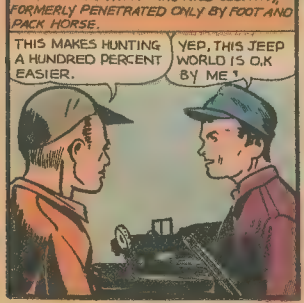

THE MIGHTY JEEP CAN PROVIDE UP TO 30-HORSE-POWER, ENOUGH ENERGY TO SAW THRU GIANT TREES.
RECKON WE HAVE ENOUGH WOOD SAWED, ELMER?
SURE THING! WITH THAT JEEP, WE CAN REALLY GET DONE IN A HURRY!
THE JEEP CAN SUPPLY POWER FOR ELECTRICITY ON FARMS, AS WELL AS BALE STRAW AND SHELL CORN.
OUT WEST A JEEP CAN RIDE THE RANGE, ROUNDING UP CATTLE IN LESS THAN 30 MINUTES, A TASK WHICH USED TO TAKE 6 COW-HANDS 12 HOURS TO ACCOMPLISH
THE JEEP CAN EASILY PLOUGH THRU MUDDY ROADS AND PROMPTLY BRING MAIL TO EVEN THE MOST ISOLATED AREAS.
U.S. MAIL
COAL AND IRON PRODUCTION CAN BE SPEEDED UP BECAUSE JEEPS CAN QUICKLY AND SAFELY TRANSPORT LOADS THRU DANGEROUS UNDERGROUND PASSAGES

THE U.S. FOREST SERVICE HAS SUCCESSFULLY TESTED TWO JEEPS AS A TEAM IN FIRE FIGHTING. ONE JEEP CARRIES A CREW OF 5 MEN--- THE OTHER CARRIES HAND TOOLS, POWER PUMP, AND A WATER TANK.

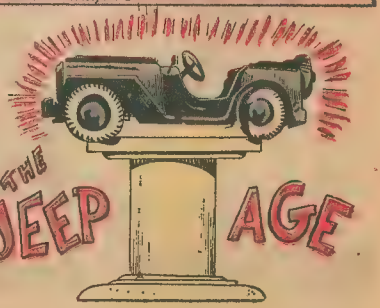


IN FLORIDA, A JEEP EDGED ITS WAY AMONG ROWS OF ORANGE TREES, TOO CLOSE TOGETHER FOR ORDINARY TRUCKS, ENABLING GROWERS TO CARRY OUT FRUIT IN RECORD TIME.

HUNTERS AND FISHERMEN WILL USE THE JEEP TO TAKE THEM THRU WILD COUNTRY FORMERLY PENETRATED ONLY BY FOOT AND PACK HORSE.



NOT ONLY IS THE JEEP EFFICIENT, BUT IT IS ECONOMICAL, TOO



PLANT WONDERS

COLCHICHINE ·· A YELLOWISH WHITE POWDER RESEMBLING ICING SUGAR IN APPEARANCE ·· HAS CAUSED A VERITABLE REVOLUTION IN THE PLANT WORLD ··· WITH SCIENTISTS PREDICTING SPECTACULAR AND WONDERFUL THINGS FOR THE FUTURE !

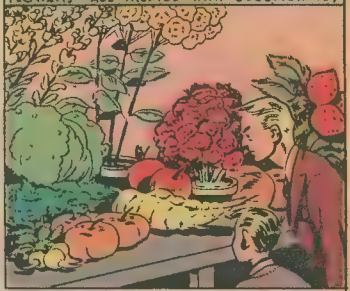
IN OLD CONSTANTINOPLE ··· THE NATIVES RECOGNIZED COLCHICHINE AS A CURE FOR GOUT.
MY GOUT PAINS INTENSELY !
TAKE THIS POWDER, IT WILL CURE YOU !

THEN, IN 1937--TWO SCIENTISTS--AMOS G. AVERY AND ALBERT F. BLAKESLEE BEGAN EXPERIMENTS ON WEEDS AND VEGITABLES AT THE CARNEGIE INSTITUTION, COLD SPRING HARBOR, NEW YORK.
LATER-THEY DECIDED TO SOAK SEEDS, OF VARIOUS KINDS, IN A SOLUTION OF COLCHICHINE AND WATER.
NEXT--THEY PLANTED THE SEEDS.
A FEW WEEKS AFTERWARD
THE SIZE OF THESE PLANTS IS SIMPLY ASTOUNDING!
WE'LL PUT THIS PLANT UNDER THE MICROSCOPE AND SEE WHAT HAPPENS!
I PREDICT THAT WE'RE IN FOR A SHOCK!
TO THEIR AMAZEMENT--BLAKESLEE AND AVERY DISCOVERED THAT EACH CELL CONTAINED TWICE THE USUAL CHROMOSOMES--THE TINY ORGANISMS THAT DECIDE HEREDITY IN PLANTS, MAN AND ANIMALS!
THIS PLANT IS REALLY TWO PLANTS... TWINS IN THE SAME BODY!

SOON--ANOTHER BIOLOGIST PRODUCED A MAMMOTH MINT PLANT WITH COLCHICHINE!

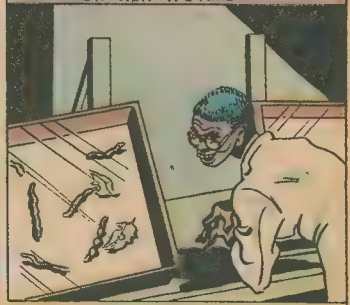
I'M CONFIDENT THIS PLANT CONTAINS MORE AND BETTER MINT OIL

SHORTLY AFTERWARDS--- EXHIBITIONS FEATURED BIGGER AND BETTER TASTING VEGITABLES--AND LARGER SWEETER SMELLING FLOWERS--ALL TREATED WITH COLCHICHINE!

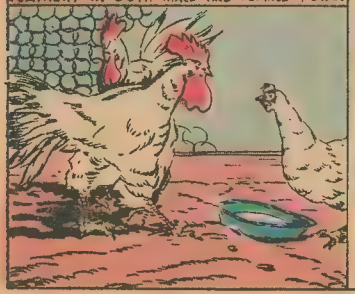


FURTHER TESTS PROVED THAT ALL PLANTS WERE AIDED BY THE POWERFUL DRUG-- EXCEPT YEAST PLANT AND THE AUTUMN CROCUS.

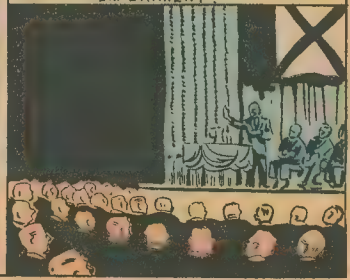
THEN--A JAPANESE BIOLOGIST ANNOUNCED THE DRUG HAD BEEN SUCCESSFULLY USED ON SILK WORMS.



IN 1940--CHICKEN EGGS WERE TREATED WITH COLCHICHINE DURING INCUBATION --RESULTING IN LARGER COMBS AND TAIL FEATHERS IN BOTH MALE AND FEMALE FOWL!



DURING THE WAR--TWO CANADIAN AGENCIES-- THE DOMINION DEPARTMENT OF AGRICULTURE AND THE NATIONAL RESEARCH COUNCIL OF CANADA--STARTED A FAR REACHING EXPERIMENT!

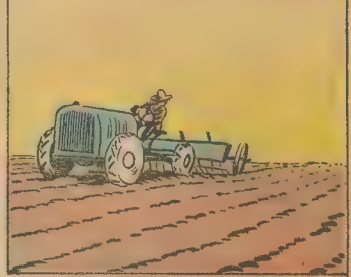


"GENTLEMEN, THE FARMERS OF SASKATCHEWAN HAVE PLOWED UNDER MUCH OF THEIR LAND THE PAST FEW YEARS·· LAND WHICH SHOULD HAVE BEEN USED FOR GRAZING!"

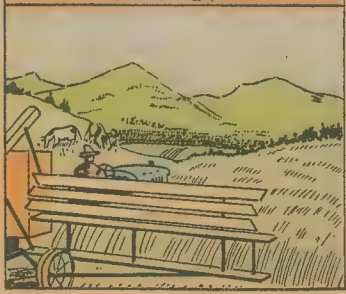
"AS A RESULT·· THEIR LAND HAS BEEN TURNED INTO DESERTS PLAGUED WITH SAND AND DUST STORMS·· BUT I THINK WE CAN HELP THEM WITH COLCHICHINE!"

WITH THE AID OF COLCHICHINE ··· BIOLOGISTS CROSSED SEVERAL SPECIES OF PERENIAL WHEAT GRASS WITH CULTIVATED WHEAT·· PRODUCING A REMARKABLE NEW HYBRID GRASS SEED.

THE NEW SEED WAS SOWED IN THE RAVAGED SOIL OF SASKACHEWAN.



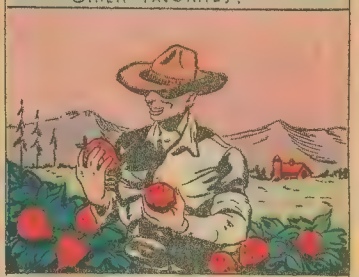
RECENTLY·· SCIENTISTS HARVESTED THE SIXTH GENERATION OF A CROP WHICH ULTIMATELY MAY REVOLUTIONIZE CATTLE BREEDING!



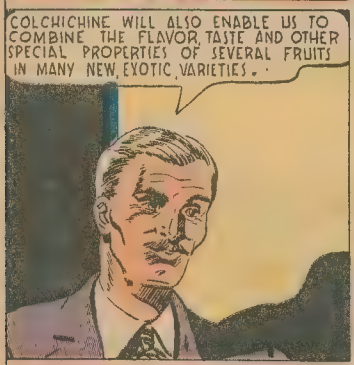
CANADIAN HORTICULTURISTS HAVE ALSO USED COLCHICHINE IN EXPERIMENTS WITH TREES· AND ULTIMATELY MAY SUCCEED IN REDUCING TO 2 YEARS A PROCESS WHICH NOW TAKES 40 TO 150 YEARS!

DR. A.W.S. HUNTER, OF THE HORTICULTURAL DIVISION OF THE DOMINION EXPERIMENTAL FARM HAS USED COLCHICHINE TO CREATE A SPECTACULARLY BEAUTIFUL SNAPDRAGON··· TWICE THE SIZE OF THE ORDINARY VARIETY.

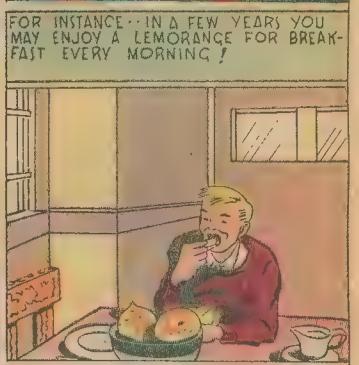
DR. HUNTER FORECASTS THE GREATEST CHANGES IN SMALL FRUITS·· PREDICTING THAT WE WILL SOON ENJOY MAMMOUTH STRAWBERRIES, PLUMS, CHERRIES AND MANY OTHER FAVORITES!



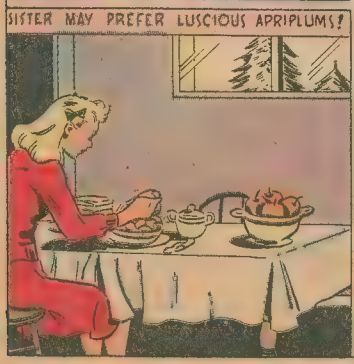
COLCHICHINE WILL ALSO ENABLE US TO COMBINE THE FLAVOR, TASTE AND OTHER SPECIAL PROPERTIES OF SEVERAL FRUITS IN MANY NEW, EXOTIC, VARIETIES..



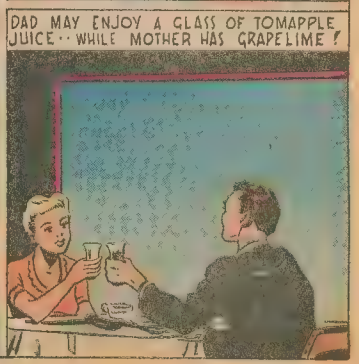
FOR INSTANCE·· IN A FEW YEARS YOU MAY ENJOY A LEMORANGE FOR BREAKFAST EVERY MORNING!

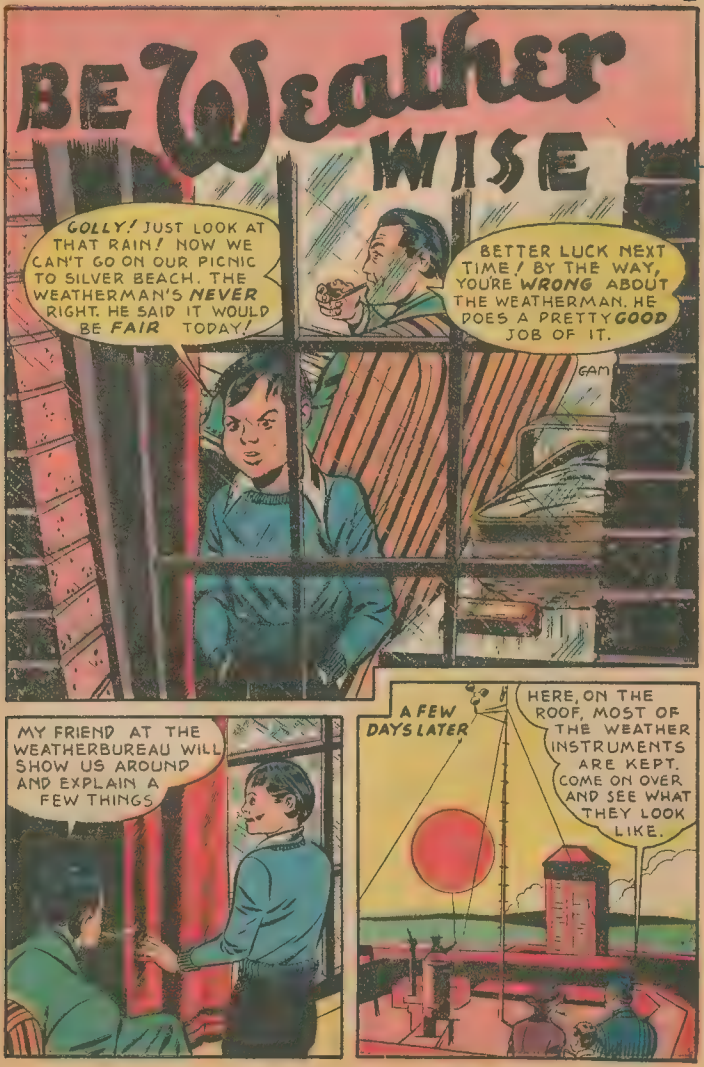


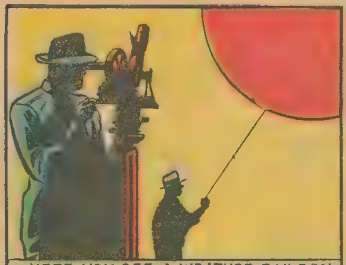
SISTER MAY PREFER LUSCIOUS APRIPLUMS!



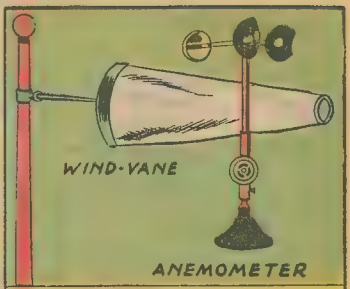
DAD MAY ENJOY A GLASS OF TOMAPPLE JUICE·· WHILE MOTHER HAS GRAPELIME!



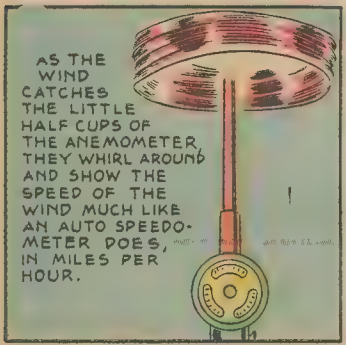

BE Weather WISE
GOLLY! JUST LOOK AT THAT RAIN! NOW WE CAN'T GO ON OUR PICNIC TO SILVER BEACH. THE WEATHERMAN'S NEVER RIGHT. HE SAID IT WOULD BE FAIR TODAY!
BETTER LUCK NEXT TIME! BY THE WAY, YOU'RE WRONG ABOUT THE WEATHERMAN. HE DOES A PRETTY GOOD JOB OF IT.
GAM
MY FRIEND AT THE WEATHERBUREAU WILL SHOW US AROUND AND EXPLAIN A FEW THINGS
A FEW DAYS LATER
HERE, ON THE ROOF, MOST OF THE WEATHER INSTRUMENTS ARE KEPT. COME ON OVER AND SEE WHAT THEY LOOK LIKE.



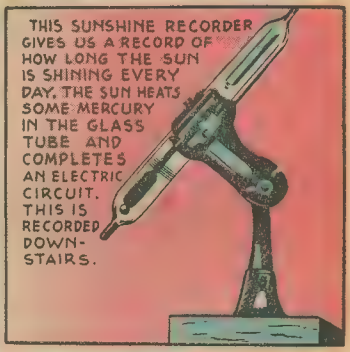
HERE YOU SEE A WEATHER BALLOON BEING SENT UP INTO THE AIR. BY FOLLOWING ITS PATH WITH THIS INSTRUMENT, WE FIND THE SPEED AND DIRECTION OF THE WIND.



THESE TWO ALSO TELL US MUCH ABOUT THE WIND. THE WIND-VANE SHOWS WHICH WAY THE WIND BLOWS.

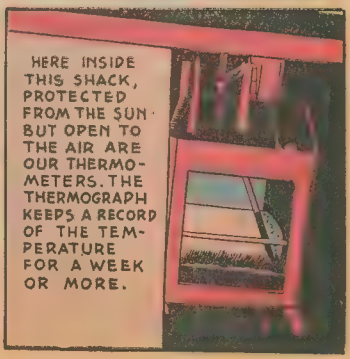


AS THE WIND CATCHES THE LITTLE HALF CUPS OF THE ANEMOMETER, THEY WHIRL AROUND AND SHOW THE SPEED OF THE WIND MUCH LIKE AN AUTO SPEEDOMETER DOES, IN MILES PER HOUR.

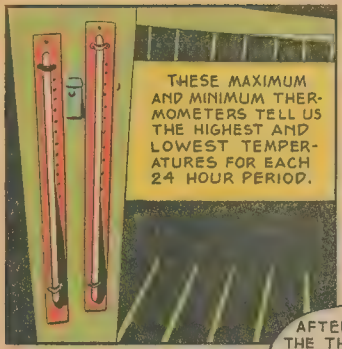


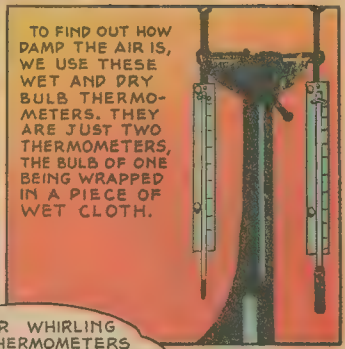
THIS SUNSHINE RECORDER GIVES US A RECORD OF HOW LONG THE SUN IS SHINING EVERY DAY. THE SUN HEATS SOME MERCURY IN THE GLASS TUBE AND COMPLETES AN ELECTRIC CIRCUIT. THIS IS RECORDED DOWNSTAIRS.

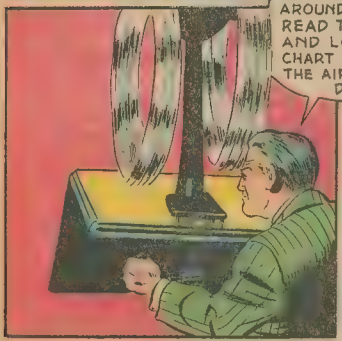
THE RAIN GAUGE KEEPS A RECORD OF THE AMOUNT OF RAINFALL. IT IS NOTHING MORE THAN A BIG CAN OPEN AT THE TOP. WATER FILLS A LITTLE BUCKET INSIDE. THE AMOUNT IS MEASURED ELECTRICALLY.

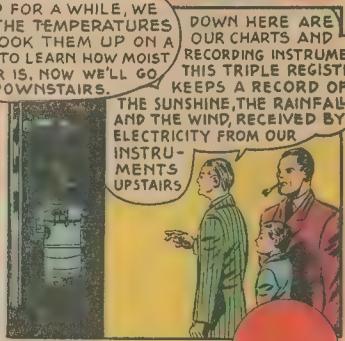


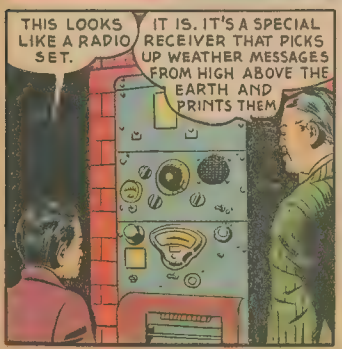
HERE INSIDE THIS SHACK, PROTECTED FROM THE SUN BUT OPEN TO THE AIR ARE OUR THERMOMETERS. THE THERMOGRAPH KEEPS A RECORD OF THE TEMPERATURE FOR A WEEK OR MORE.

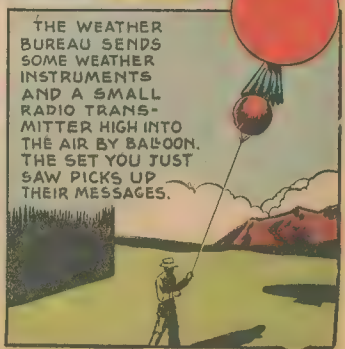

THESE MAXIMUM AND MINIMUM THERMOMETERS TELL US THE HIGHEST AND LOWEST TEMPERATURES FOR EACH 24 HOUR PERIOD.


TO FIND OUT HOW DAMP THE AIR IS, WE USE THESE WET AND DRY BULB THERMOMETERS. THEY ARE JUST TWO THERMOMETERS, THE BULB OF ONE BEING WRAPPED IN A PIECE OF WET CLOTH.


AFTER WHIRLING THE THERMOMETERS AROUND FOR A WHILE, WE READ THE TEMPERATURES AND LOOK THEM UP ON A CHART TO LEARN HOW MOIST THE AIR IS. NOW WE'LL GO DOWNSTAIRS.


DOWN HERE ARE OUR CHARTS AND RECORDING INSTRUMENTS. THIS TRIPLE REGISTER KEEPS A RECORD OF THE SUNSHINE, THE RAINFALL, AND THE WIND, RECEIVED BY ELECTRICITY FROM OUR INSTRUMENTS UPSTAIRS


THIS LOOKS LIKE A RADIO SET.
IT IS. IT'S A SPECIAL RECEIVER THAT PICKS UP WEATHER MESSAGES FROM HIGH ABOVE THE EARTH AND PRINTS THEM


THE WEATHER BUREAU SENDS SOME WEATHER INSTRUMENTS AND A SMALL RADIO TRANSMITTER HIGH INTO THE AIR BY BALLOON. THE SET YOU JUST SAW PICKS UP THEIR MESSAGES.

AND NOW, HERE IS TODAY'S OFFICIAL WEATHER FORE-CAST

FROM A MAP WHICH WE GET BACK FROM WASHINGTON, WE MAKE EACH DAY'S FORECAST. THIS IS SENT TO ALL NEWSPAPERS AND RADIO STATIONS.

LATER I GUESS I'LL HAVE TO TAKE BACK WHAT I SAID ABOUT THE WEATHERMAN. AFTER SEEING HOW THEY GO ABOUT FORECASTING, THEY SURELY KNOW THEIR STUFF

THAT'S RIGHT. I WAS LOOKING AT SOME RECORDS WHILE WE WERE THERE, AND I FOUND OUT THAT THE WEATHER BUREAU IS CORRECT ALMOST NINE TIMES OUT OF TEN

THE END

AND NOW BOYS AND GIRLS, HOW WOULD YOU LIKE TO MAKE SOME WEATHER FORECASTS AT HOME ?

ALL YOU NEED ARE THE FOLLOWING: SOME WATER, A SMALL PIECE OF CLOTH OR PAPER, A PAN OR SMALL DISH, AND A CHEMICAL CALLED COBALT CHLORIDE. THE CHEMICAL IS EASY TO GET AT ANY OF THE CHEMICAL SUPPLY COMPANIES OR AT SCHOOL. YOU NEED ONLY A SMALL AMOUNT.

COBALT CHLORIDE

HERE IS WHAT YOU DO:

DISSOLVE ENOUGH OF THE COBALT CHLORIDE IN WATER TO MAKE A FAIRLY DEEP PINK COLOR. YOU DO THIS IN THE PAN OR DISH.

THEN SOAK THE PIECE OF PAPER OR CLOTH IN THIS SOLUTION UNTIL IT IS THOROUGHLY WET.

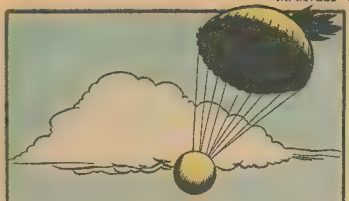
HANG THE SOAKED PIECE OF PAPER OR CLOTH UP TO DRY IN A CONVENIENT PLACE. OVER A SINK IS BEST SO AS TO CATCH THE DRIPPINGS.

WHEN IT IS DRY, TACK IT UP ON A WALL OR A PIECE OF BOARD AND PLACE IT WHERE YOU CAN SEE IT EASILY.

WHEN THE AIR IS DAMP THE CHEMICAL IN THE CLOTH OR PAPER WILL TURN PINK LIKE THIS.

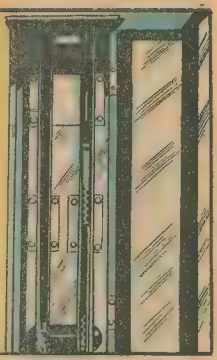
WHEN THE AIR IS DRY THE CHEMICAL WILL TURN BLUE LIKE THIS.

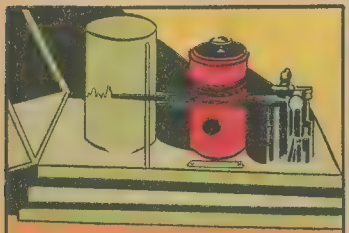
YOU CAN MAKE A WEATHER FORE-CAST BECAUSE WHEN THE AIR IS DAMP IT WILL TURN CLOUDY OR RAINY, AND WHEN THE AIR IS DRY IT WILL MOST LIKELY STAY CLEAR AND SUNNY.



THESE BALLOONS GO UP ANYWHERE FROM 8 TO 20 MILES ABOVE THE EARTH. THE BALLOON FINALLY BURSTS, AND THE EQUIPMENT FLOATS DOWN BY PARACHUTE, TO BE USED AGAIN LATER.

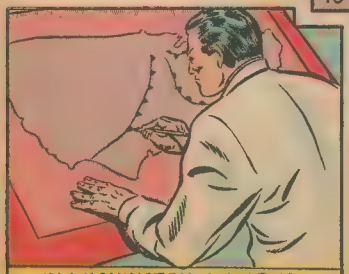
THE BAROMETERS THAT YOU SEE HERE ARE PROBABLY OUR MOST USEFUL INSTRUMENTS. THEY TELL US THE AIR PRESSURE. WE USE TWO OF THEM IN ORDER TO CHECK UP ON THEIR READINGS.



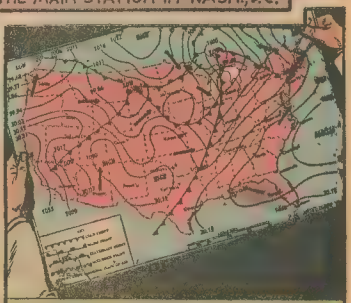


THIS BAROGRAPH KEEPS A CONTINUOUS RECORD OF THE AIR PRESSURE FOR A WEEK OR LONGER.

AFTER GATHERING OUR INFORMATION, WE AND HUNDREDS OF OTHER WEATHER STATIONS ALL OVER THE COUNTRY TELEGRAPH IT TO THE MAIN STATION IN WASH., D.C.



IN WASHINGTON A MAP IS DRAWN, SHOWING THE WEATHER CONDITIONS ALL OVER THE COUNTRY.



THIS IS WHAT A FINISHED MAP LOOKS LIKE

NEW Inventions

TAKE ONE PART YANKEE INGENUITY.... ONE PART INVENTIVE GENIUS... A LIBERAL MEASURE OF SCIENTIFIC KNOW-HOW... PLUS A DASH OF PERSEVERANCE... AND YOU HAVE THE TYPICAL AMERICAN INVENTOR THE MAN WHO CONSTANTLY MAKES YOUR LIFE MORE COMFORTABLE... MORE INTERESTING... AND INFINITELY MORE EXCITING!

GAM

ONE OF THE MOST INTERESTING NEW INVENTIONS IS A MACHINE... DEVELOPED BY EUGENE B. POWER AND ROBERT D. HOUSE, OF ANN ARBOR, MICH .. WHICH ENABLES HOSPITALIZED VETERANS AND CIVILIANS TO READ COMFORTABLY THOUGH BEDRIDDEN

OPERATING A PANEL WITH 3 BUTTONS, THE PATIENT FLASHES THE PAGES OF A BOOK ON THE CEILING... AND TURNS, THE PAGES FORWARD OR BACKWARD AT WILL!

PHONOGRAPH FANS WILL HAIL THE NEW LIGHT WEIGHT UNBREAKABLE VINYL-RESIN RECORDS....RECENTLY PUT ON THE MARKET BY RCA VICTOR!

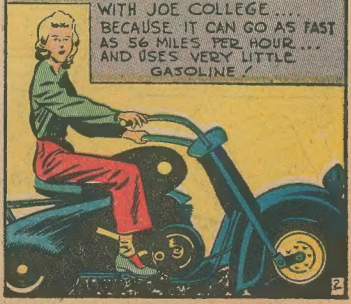
RESEMBLING A TYPEWRITER WITH A STANDARD KEYBOARD...THE NEW TYPATUNE HAS 32 MUSICAL NOTES... AND CAN BE USED EITHER AS A MUSICAL INSTRUMENT OR TO TEACH TOUCH-TYPING!

VERY SOON.... AUTOMOBILISTS CAN ENJOY TWO-WAY TELEPHONE SERVICE WHICH WILL OPERATE ON THE "WALKIE TALKIE" PRINCIPAL!

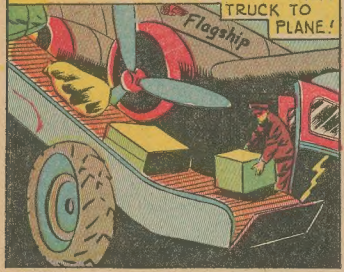
DEVELOPED BY THE AMERICAN TELEPHONE AND TELEGRAPH COMPANY...THESE MOBILE RADIO-TELEPHONES WILL BE AS SIMPLE TO OPERATE AS HOME SETS!

NEW TRANSPARENT AUTOMOBILE WINDSHIELD....CREATED BY THE AMERICAN OPTICAL COMPANY... REDUCES GLARE...PROVIDES CLEARER VISIBILITY....AND SHOULD GREATLY REDUCE ACCIDENTS!

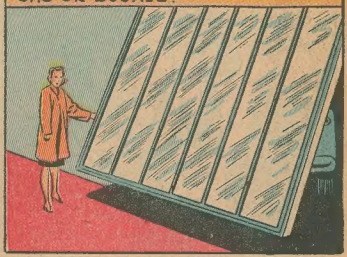
WITHIN A FEW MONTHS...THIS GEARLESS SPEEDSTER WILL BE A FAVORITE WITH JOE COLLEGE.... BECAUSE IT CAN GO AS FAST AS 56 MILES PER HOUR... AND USES VERY LITTLE GASOLINE!



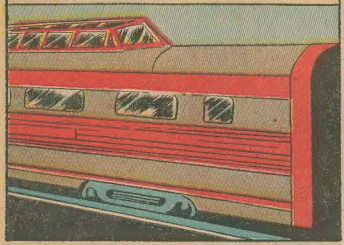
AIR SCHEDULES CAN BE SPEEDED UP... IF ALL THE AIR LINES ADOPT THE NEW PORTABLE ESCALATOR... WHICH SENDS A CONTINUOUS FLOW OF CARGO FROM TRUCK TO PLANE!



CONSTRUCTED BY AIRCRAFT METHODS.. THIS ALUMINUM OVERHEAD GARAGE DOOR IS SO LIGHT IT CAN BE OPENED BY A TOT... AND IT WONT SAG OR BUCKLE!

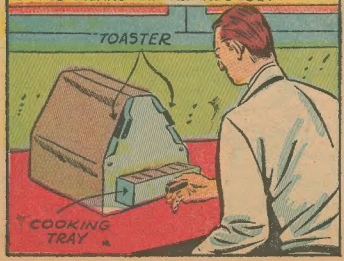


NOW IN OPERATION OVER THE BURLINGTON SYSTEM... STRIKING VISTA-DOME RAILROAD CARS ENABLE PASSENGERS TO ENJOY A COMPLETE VIEW OF ALL SCENERY!



NEXT CHRISTMAS... YOUR TREE WILL LIKELY BE ADORNED WITH NEW MULTICOLORED FLUORESCENT BULBS... INTRODUCED BY SYLVANIA PRODUCTS... WHICH CAN BE USED INDOORS AND OUT WITH COMPLETE SAFETY!

BENEFACTOR OF THE BREAKFAST TABLE.. THAT'S DANIEL PLATKIN OF LOS ANGELES.. WHO HAS INVENTED A COMBINATION TOASTER-COOKER... TOASTS BREAD AND COOKS EITHER BACON, EGGS, CHOPS, OR SMALL STEAKS SIMULTANEOUSLY!



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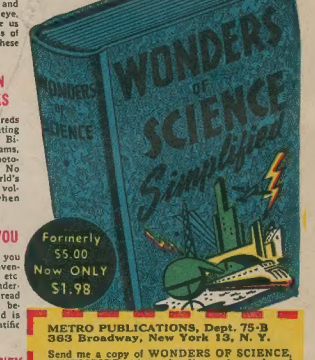

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